STATE OF MINNESOTA DISTRICT COURT

COUNTY OF RAMSEY SECOND JUDICIAL DISTRICT

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The State of Minnesota,
by Hubert H. Humphrey, III,
its attorney general,
and
Blue Cross and Blue Shield
of Minnesota,

Plaintiffs,

vs. File No. C1-94-8565

Philip Morris Incorporated, R.J.
Reynolds Tobacco Company, Brown
& Williamson Tobacco Corporation,
B.A.T. Industries P.L.C., Lorillard
Tobacco Company, The American
Tobacco Company, Liggett Group, Inc.,
The Council for Tobacco Research-U.S.A.,
Inc., and The Tobacco Institute, Inc.,

Defendants.

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DEPOSITION OF CATHY L. ELLIS

Volume III, Pages 544 - 683

http://legacy.library.ucsf.edu/tid/eut05a00/pdf
Source: https://www.industrydocuments.ucsf.edu/docs/jkxd0001

(The following is the continued deposition of CATHY L. ELLIS, taken pursuant to Rule 30.02(f), at the offices of Hunton & Williams, 1900 K Street N.W., Washington, D.C., commencing at approximately 9:13 o'clock a.m., December 4, 1997.)

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I N D E X

EXHIBITS		DESCRIPTION	PAGE MARKED
Plfs' Ex	4858	Memo dated October 11, 1963, Bavley to Wakeham, Bates 2022242315-9	606
	4859	"FTR RESEARCH REPORT 1962-1966," Bates 1001808680-722	622
	4860	Report, "NITROSAMINES IN FOOD, ALCOHOLIC BEVERAGES, AND TOBACCO - OCCURRENCE AND TOXICOLOGY," Bates 1000028264-84	649

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P R O C E E D I N G S

(Witness previously sworn.)

CATHY L. ELLIS

called as a witness, being previously sworn, was examined and testified as follows:

ADVERSE EXAMINATION (cont'd)

BY MR. SILBERFELD:

Q. Good morning, Dr. Ellis.

A. Good morning.

Q. We're here to continue and finish today your deposition. You have been designated by Philip Morris as the person most knowledgeable about two topics that remain for discussion today, those topics are public statements that the company has made or participated in or authorized, and the second topic is the topic of smoking and health. You understand that?

A. Yes.

Q. With respect to both those topics, can you tell me what you have done in order to prepare yourself for giving testimony here today?

A. Well most specific -- most specifically and very recently I have reviewed the predesignated documents that you have designated, so that is the specific, I

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think, review for -- for this portion of the deposition, and before that, obviously now for a number of years, I've been involved in, and as part of my job, involved in reviewing the work that Philip Morris has done for many years in the area of smoking and health, and have myself participated in some of the company statements recently.

Q. By "participating in the company statements," do you mean anything other than the congressional testimony and the statements surrounding that?

A. Yes.

Q. Others?

A. Yes. We recently put out a public statement to Congress, members of Congress and -- and others, regarding causation, addiction and disease.

Q. Do you have that?

A. No, I don't.

Q. What's the essence of it?

A. The essence of it is simply to explain our position. It was requested by members of Congress and the plaintiffs' attorneys in conjunction with the settlement.

Q. In conjunction with the national --

A. Right.

Q. -- settlement?

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A. Right.
Q. What position did Philip Morris take in conjunction with that statement on the subject of addiction?
A. Basically the position on the subject of addiction related to the fact that it is recognized that there are individuals that believe that smoking is addictive and perhaps that nicotine is addictive. However, there has been over the years a very confusing set of criteria that go to define that term, there isn't a consistent set of criteria, and that the position really relates to the fact that many people have been able to quit and do quit today, and that is fundamentally the basic premise on which we believe that smoking is non-addictive.
Q. There was a statement issued on the subject of smoking and disease?
A. No.
Q. What was the second part of it?
A. Causation, --
Q. Causation.
A. -- really, specifically.
Q. All right. What was said about the subject of causation?
A. Again, that there is evidence to have others

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conclude that -- that smoking causes certain diseases. However -- and that is certainly a judgment that one can make. However, there is no scientific evidence that specifically -- that is, in controlled experimental studies, to prove scientifically cause and effect.

Q. Is that your view today as well on the subject of --

A. As a scientist, absolutely.

Q. -- on the subject of causation?

A. Absolutely. As a scientist, yes.

Q. Have you looked at any Philip Morris documents other than those that were predesignated on the subjects of public statements and smoking and health --

A. Um --

Q. -- in order to prepare yourself for today?

A. Not specifically for this deposition, no. I mean --

Q. How about earlier?

A. -- documents all the time -- I read documents all the time, but no, no, not specifically for today. I mainly reviewed the pre -- predesignated documents that were provided and listed.

Q. Okay. For example, did you look at any

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historical data? I understand that you read your mail every day and you get lots of information sent to you, I'm sure.

A. Uh-huh.

Q. I'm more interested in whether or not you looked back over the 40 years that we're concerned about in this case, going back into the 1950s, other than those documents that were predesignated by me?

A. I have documents relating to the past 40 years and I have other activities going on relative to an expert statement that's due next week, so in conjunction with some other activities I have been reviewing other -- other documents, yes.

Q. In what connection is that expert statement going to be filed?

A. In Minnesota. And I also have to designate --

Q. Oh.

A. I also have to designate exhibit documents by the 18th of December, so I'm obviously reviewing many documents for that purpose.

Q. You're talking about the supplemental expert report that's due on Monday?

A. Correct.

Q. And do you have with you any of the documents that you looked at other than those that were

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predesignated which I have presented?
A. No.
Q. With respect to the documents you looked at for purposes of supplementing your expert report, do you have any of those in mind?
THE WITNESS: Could you repeat that, please?
(Record read by the court reporter.)
A. Not specifically, no, not -- not for this particular deposition, no.
Q. How about the topics covered by those documents?
A. Do I have the topics in mind?
Q. Uh-huh.
A. Sure. I mean I --
You know, we have to know the topics in order to select the -- the documents. But it's a very broad range that doesn't necessarily pertain to -- to this particular topic too. Some of it does, obviously, but there are many other topics.
Q. With respect to your review of the predesignated documents for the two subjects for today, --
A. Uh-huh.
Q. -- what did you do specifically with regard to -- to them?
A. I read them.

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Q. Okay. Did you make any notes about them?
A. No.
Q. Did you make any marks on the documents?
A. I highlighted on -- in some -- on some of them, but not all of them.
Q. Where are those documents, the highlighted ones?
A. In my office.
Q. Where is that?
A. In Richmond.
Q. You didn't bring those with you?
A. No.
Q. Any particular reason why not?
A. The volume. And I had completed my reading, I had no reason to bring them.
Q. Okay. What did you highlight?
A. I couldn't recall. I'm -- I've been reading them now for the last couple of weeks. I -- just specific statements in the -- in various documents.
Q. As a result of your reading of the predesignated documents, did you talk to anybody within Philip Morris?
A. Within Philip Morris?
Q. Uh-huh.
A. On a couple of occasions I might have come across a situation, and I -- one I -- I recall

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specifically where I wanted to get additional information and I made a phone call.

Q. Tell me about that.

A. There was some mention of a triple filter in one of the documents, and I called to find out information in the past about a triple filter.

Q. Who did you call?

A. I called a person in our product testing laboratory that does a lot of brand history and competitive information and asked what records we had on -- on that product.

Q. And what were you told?

A. I was told that we did have some records and -- and that most likely that was referring to a plug-space-plug filter, cellulose acetate, a space, and cellulose acetate.

Q. Did you get some additional documents --

A. No.

Q. -- sent to you?

A. No.

Q. Okay. Who did you speak to?

A. Susan Lafoon.

Q. Susan --

A. Susan Lafoon, L-a-f-o-o-n.

Q. And she's in Richmond?

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A. Yes.
Q. Other than Susan Lafoon on the topic of the triple filter, did you speak to anyone else about any subjects or topics that were raised in your mind, having reviewed the predesignated documents?
A. In Richmond, no.
Q. Anywhere?
A. Last night with Chip.
Q. Okay. Anyone else?
A. No.
Q. With respect to the collection of documents on smoking and health that were predesignated, --
A. Uh-huh?
Q. -- do you have a belief, speaking now for the company, not for you individually, as to whether or not those documents collectively represent what Philip Morris knew at or about the time that the documents are dated on the subject of smoking and health?

MR. NUNLEY: Objection as to form.

THE WITNESS: Yeah, I need that reread.

(Record read by the court reporter.)

MR. NUNLEY: Same objection.

A. I'm confused. The predesignated documents?
Q. Yes.

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A. Oh, I think that there are many more documents that would add to the collection that were there that would illuminate, I think, some of the knowledge in the area.

Q. Have you done anything to collect those documents?

A. Collect specifically? I certainly have some of those documents, yes.

Q. With you?

A. No.

Q. Let me understand what you're saying to us.

A. Uh-huh, right.

Q. A particular document was -- which was predesignated --

A. Uh-huh.

Q. -- relates in your mind to some other document that you're aware of?

A. No, no. You asked, I think, if that set of documents that was predesignated represent the knowledge of Philip Morris at the time, and what I'm trying to say --

Q. That's right.

A. -- is that there are many other documents, I think, that would add to the knowledge base that are represented by those -- that -- that set of

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documents, that's all.

Q. And have you done anything to collect those other documents that would add to the knowledge base?

MR. NUNLEY: You mean -- excuse me. Do you mean for purposes of the deposition, or in her career at Philip Morris?

MR. SILBERFELD: For any -- for any purpose.

A. Certainly as part of my job I've been reading those documents. As part of selecting documents for exhibits in expert reports, I've been looking at those documents for, gee, 18 months now.

Q. So we might see some of those next week when we get your expert report; is that the idea?

MR. NUNLEY: Well I --

A. I believe you have those.

MR. NUNLEY: I object to that, I mean, to the extent that suggests that they haven't been produced previously.

MR. SILBERFELD: That's not the suggestion at all. There's 32 million documents somewhere.

Q. My point was in terms of your placing some importance on them to round out the story that the predesignated documents tell, you've collected some

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documents that you believe tell a fuller story?
A. It's not a matter of -- of fuller. I think that -- I think that you -- you have predesignated documents in that -- in that -- in the binder that I've -- I've looked at, and there are documents that you already have access to that I would add and in my opinion add to that story, yes.
Q. Okay. And those specific ones that in your opinion add to the story, --
A. Uh-huh.
Q. -- is it your intention to make those part of your supplemental expert report?
MR. NUNLEY: Well, I mean, I object because it -- if the question is is the purpose of the supplemental expert report to identify every document that rounds out the story, I think you and I both know that's not the purpose, and I think it's misleading to suggest, as your question does, that that is the purpose of the expert report.
MR. SILBERFELD: I just asked the question. Would you mind answering it?
A. I -- I can only say that I believe that there are other documents that better complete the story of what was known by Philip Morris over the years that I've looked at. Specifically what will be designated

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and what will be in exhibits I think is another question, and that hasn't been determined yet.

Q. Okay. But that work is in process?

A. Absolutely.

Q. So with respect to the collection of smoking-and-health documents, for example, that I predesignated for today, do you believe that as to those, they represent the belief or the knowledge of Philip Morris at or about the time that those documents were written, --

MR. NUNLEY: Objection as to form.

Q. -- even in part?

A. The -- the documents that you predesignated?

Q. Yes.

A. I think they're, again, just a -- a part. I think there are other documents and other -- other -- other external literature that -- that isn't represented in that -- in that -- in those predesignated documents. There is a lot of external literature that was available that would better reflect the knowledge of the scientific community over the years.

Q. I wasn't speaking of the scientific community, I was speaking of Philip Morris.

A. Uh-huh. Well, Philip Morris would certainly

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reflect the scientific community knowledge. I mean that would be something that would be -- we would obviously look at and -- and evaluate over the years.

Q. Philip Morris keeps abreast, does it not, of the world medical and scientific literature as it relates to its business?

A. Absolutely.

Q. And has for 40 years?

A. Yes.

Q. So to the extent something was known in the world medical literature or the world scientific literature, that would be the knowledge of Philip Morris as well?

MR. NUNLEY: Objection, vague.

A. We would certainly review the documents, we would certainly look at the literature and we would certainly respond appropriately over the time -- over those years, yes.

Q. But to the extent something was known out there in the world medical or scientific literature, that would be at least some notice to Philip Morris because it does keep abreast of that literature; right?

MR. NUNLEY: Objection. I don't know what you mean by the term "known." Whether you mean

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established, written about, I don't know. "Known" to me is a vague term and I object.

MR. SILBERFELD: Go ahead.

A. I -- I'm confused about "notice." Notice for what is my -- my question.

Q. Just notice that something's out there.

A. Well we --

Like I said, we certainly did review the literature and -- and did have our own work going on in many areas. So if that's notice, yes, we did -- we did notice.

Q. And that would be true over at least 40 years.

A. Four or 40?

Q. Forty.

A. Yes. Yes.

Q. Also four.

Have you done anything to collect specific references from the world medical and scientific literature on the subjects of smoking and health?

MR. NUNLEY: "You" there being Philip Morris?

MR. SILBERFELD: Yes.

A. Yes. Yes. We actually over the years in our library have had a specific process whereby we reviewed and have a computer hookup to the literature

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databases, and every week we get a printout of pertinent literature, and in many cases those are reviewed by people with expertise in the areas and copies are then obtained of those -- those reports. And individuals, on specific important literature references, there's discussion on that literature reference. So there is a process, yes.

Q. The discussion occurs as part of a regular process?

A. There is a regular - what we call a technical assessment group that does get this literature review. They have specific assignments for topical areas. They may select certain papers. And then there is a -- a potential for, if it's -- if they deem it necessary in certain cases, there's a potential to have a discussion of that. And in some cases we invite outside people to come in and -- and provide information on that also.

Q. And that's been true for how long, --

A. This --

Q. -- that process?

A. This specific process is --

This particular one has been going on for a couple of years now. Prior to that it was more informal. Based on individual expertise, different

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individuals would keep -- keep track of their topical area. So it -- the form of it, of the process varied over time, but basically the -- the function occurred for many years.

Q. More than 20?

A. I --

Yes.

Q. More than 30?

A. I --

Yes. I believe that's reflected in the documents, yes.

Q. The other topic beyond smoking and health that we're going to talk about today is the topic of public statements made by the company or in which the company participated through other organizations. That is not really an area where you're personally involved in terms of your daily work; is that true?

MR. NUNLEY: Objection -- excuse me. Objection as to form, vague.

A. Well certainly we don't put out public statements daily as that's not necessary; we're not a public relations company. But when the -- when the -- any statement relates to a scientific issue, our R&D is -- is consulted, yes.

Q. What if anything did you do to prepare yourself

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specifically on the topic of public statements made by the company or made on its behalf?

A. In this case specifically I looked at the predesignated documents, again, and reviewed some of our annual reports, for example, and the statements that were in our annual reports.

Q. Which annual reports did you look at?

MR. NUNLEY: Which year annual reports?

MR. SILBERFELD: Generally, yeah.

A. All of them I could find, except for two years, and I think they were '50 and '51 that I couldn't find.

Q. So you looked at more than 40 of them?

A. Yeah.

Q. For purposes of what?

A. To -- to review, just because I had not done that exercise before, to see what was in the annual reports on the topic of smoking and health or research and development.

Q. And did you find any references in any of the annual reports on those subjects, R&D and smoking and health?

A. Yes.

Q. What years did you find them?

A. At --

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Very early and continuously for many years back in the '50s. There was a lot of discussion about the formation of R&D and some of the work that R&D was doing at the time, and there was many references over the years about smoking and health periodically, so it was a continuous process.

Q. Can you characterize as a body the statements you found in the annual reports on the subject of smoking and health compared to either the public statements that were predesignated or the smoking-and-health documents which were predesignated?

MR. NUNLEY: Objection. I think that's -- that's hopelessly overbroad to ask the witness to do that with 40 years of -- of documents.

A. Well --

Q. Can you do it?

A. Well let me characterize it this way: The purpose of an annual report is to report to the shareholders. From the standpoint of R&D, obviously R&D is a competitive -- potentially a competitive advantage and may produce innovations and -- and -- and advantages in the -- in the future, so that certainly is of interest to the shareholders, and I would characterize the information on R&D relevant to

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that topic. The information on smoking and health, obviously, is something that is mentioned and discussed as it relates to the company and the risk of -- for the -- the shareholders, so the -- the statements really are confined to those categories because this is a document for the shareholders. So there's no -- I would have no expectation that the annual reports would be scientific documents or would in any way be -- reflect data or communications such as these other reports.

Q. Did you find from your review that there were any inconsistent statements in the annual reports on the one hand and the public statements on the other?

A. No.

Q. Did you find any inconsistencies between what you saw in the annual reports on the subject of smoking and health and the predesignated documents on the same subjects?

MR. NUNLEY: Same objection, overbroad.

A. Yeah, I --

You know, I think many times you might have an experiment and -- and somebody might come up with a conclusion, but that doesn't necessarily mean that's going to be consistent with another experiment. So you could have different statements that are not

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consistent, but that doesn't mean that there is a fact that is inconsistent. There can be opinions that are inconsistent and judgments that are inconsistent, so it would not surprise me at all to find those in the -- in the reports.

I think what one has to look at is not individual statements or documents, but the preponderance of evidence and how it progressed over the years.

Q. Whether it's surprising or not, do you recall any inconsistencies between the annual-report statements on the subject of smoking and health and the predesignated documents on the same subject?

MR. NUNLEY: Same objection.

A. Based on my scientific interpretation of those -- those predesignated documents, including my judgment as to the quality of the data, the time in which the studies were done, the sources, et cetera, no.

MR. SILBERFELD: The record should reflect that the cupboard is still bare; there's no food here whatsoever.

MR. NUNLEY: The record can also reflect that I am very embarrassed about that, and if you'd like to take a break, I will run out to Starbuck's

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and personally bring you back something.

MR. SILBERFELD: It is --

MR. WEIL: This would never happen in Richmond.

MR. SIPKINS: I'm having a hypoglycemic attack here.

MR. SILBERFELD: Or in Los Angeles, where it's 6:40 a.m.

BY MR. SILBERFELD:

Q. Let's turn, if we may, Dr. Ellis, to the subject of the public statements. That's the smaller stack of documents. We'll get through those.

Let me show you first what's been previously marked as Exhibit 1148. This is the Frank Statement to cigarette smokers. You're generally familiar with the document; are you not?

A. Yes.

Q. Okay. In fact we talked about it at the last session of your deposition.

A. Yes.

Q. Since that time have you done any work in order to gain an understanding or a better understanding as to the circumstances surrounding Philip Morris's participation in the Frank Statement in 1954?

A. No.

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Q. Have you spoken to anyone in the company about the Frank Statement at all?

A. Since the last deposition --

Q. Yes, uh-huh.

A. -- or in general?

Since the last deposition?

Q. Either way.

A. No, I don't recall specifically talking about this statement to anyone in the company.

Q. The Frank Statement, as you may know, was published in a number of newspapers around the country in the -- in the middle '50s. Is that your understanding?

A. Yes.

Q. And it sets forth as one of its terms an acceptance by the companies who signed the statement of an interest in people's health. Do you recall that?

MR. NUNLEY: Well objection, I think it speaks for itself what it does, what it doesn't do.

A. It -- it specifically says, "We have and always will cooperate closely with those who -- whose task it is to safeguard the public health," if that's what you're referring to.

Q. Well actually two paragraphs above that, --

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A. Okay.
Q. -- the statement, quote, --
A. All right.
Q. -- "We accept an interest in people's health as a basic responsibility, paramount to every other consideration in our business."
A. That's what it says.
Q. Was that, at the time that this statement was made, Philip Morris's operating philosophy insofar as people's health is concerned?
A. I believe that Philip Morris is interested in the public health, absolutely. If that's your question, yes.
Q. And has been for the last 40 some years?
A. Yes.
Q. Paramount to every other consideration in your business?
A. The -- the interpretation of that per se is relevant to, I think, communications and the information that's occurred since the Frank Statement. I think that, taking this at its time, one needs to then look at the public statements that are coming out after the Frank Statement. For example, the fact that the warning labels have been on the packs of cigarettes I think fundamentally

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inform the public about certain things about the product, and therefore there is a difference in terms of the -- the level of knowledge and what is known because of those warning labels.

Q. What is the effect of the warning labels on whether or not an interest in people's health is paramount to every other consideration of your business?

MR. NUNLEY: Objection as to form.

A. There -- there is no difference in that fundamentally.

Q. Okay.

A. Okay? That's not the point.

Q. What is the point?

A. The point, however, is -- is that there is information that is provided to the consumer, and that information then results in a decision process.

Q. How does that change, if at all, the company's interest in people's health?

A. It doesn't.

Q. Okay. Does Philip Morris today accept an interest in people's health, paramount to every other consideration in your business?

MR. NUNLEY: Objection as to form.

A. Yeah, I -- we -- we can --

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We can go back and forth on this. I think the -- I think the issue here is fundamentally this, is that this statement --

And there's no question that public health is important. It's important to every individual. It's important to everybody in terms of the decisions that we have and the information that we have. Smokers have on the side of the pack information, and part of that is their decision, and I think that there is a responsibility that people have to make a choice with the information given. And so, you know, it isn't -- it isn't that we're -- we're necessarily in a situation here where we make all the decisions per se; individuals must also make decisions based on the information.

Q. Do you regard this statement back in 1954 as an acceptance of the duty or a responsibility by Philip Morris in terms of its customers?

MR. NUNLEY: Objection, I think that calls for a legal opinion or conclusion, and I don't think this witness has any obligation to speculate as to legal opinions or conclusions.

MR. SILBERFELD: Go ahead.

A. All I can say is what I've seen, and what I've seen in -- in my experience is that there has been

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and continues to be a very concerted and focused and defined effort to try to understand the relationship between smoking and health, and there continues to be that, and I think that is fundamentally something that is important to do because that is our business, and I think that we are doing that.

Q. And is that concern and focus paramount to every other consideration of your business, and has it been for 40 years, or not?

A. I --

That's a judgment call. I mean one -- one person sitting here could make one judgment on that and another person sitting here could make another. I -- I -- I think that, given the scenario, the fact that we're dealing with a disease that nobody knows what the cause is, that millions of dollars are being put to the research by the National Cancer Institute and by many others worldwide to try to figure out therapies, cures, et cetera, there's a lot of work going on, a lot of focus on this, so I think that our role in this is to try to understand the product and its relationship to this particular disease.

Q. Would the expenditures that the company has made over time for research on the one hand and advertising, say, on the other hand be markers of the

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importance of smoking and health in your mind?

MR. NUNLEY: Objection, both as it being vague and, to the extent you're asking this witness questions about advertising, I think it goes beyond the designation and beyond her own expertise and information.

MR. SILBERFELD: Go ahead.

A. I think what's important is that what -- if -- if the studies that were required to be done based on the technology available at the time were pursued; in other words, if there was active work in the -- in the given area based on the level of knowledge at the time. There's no sense in throwing money at something just to throw money at something, just to do something. What is important is that you take the technology at the time and use it to its best application to the issue.

If you don't know what causes cancer, if many people are studying that, it doesn't -- doesn't help to duplicate the effort. Sometimes breakthroughs are required. Sometimes new technology is required. Sometimes new ideas need to come through in order to have a breakthrough. So it's not a matter of comparing dollars, it's a matter of looking at the progression of the work, it's a matter of looking at

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the -- the important milestone studies that were done over time.

Q. Have you looked at the research budget requests that were made by the department over any period of time to see whether those budgets were approved as requested or cut?

A. I haven't looked at the specific budgets. I have certainly seen in the documents over time the progression and the growth of R&D and the growth of funding of R&D both inside and outside the company.

Q. And have you made a comparison as to what portion of the research budget was devoted to the development of new products or new technologies as opposed to monies that were earmarked or intended for smoking-and-health issues?

A. Again I think the focus here was on what work needed to be done and what was the --

You know, if -- if you don't have an animal model, it doesn't help to do another mouse skin-painting study. If you don't have an inhalation test, it doesn't help to do a test again that doesn't give you anything. So then the question is is what do you do, and I think what it -- the issue here is that we need -- we need to have a breakthrough in terms of understanding. And so it's not just a

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matter of throwing money at the same thing.
Q. When we talk about smoking and health, you reference cancer in a number of your answers. Do you regard the topic actually to be broader than that and to include non-malignant diseases of the lung, for example?
A. Smoking and health would include any disease that's associated. There's a relative risk relative to smoking.
Q. We talked last time about the relative risk of smoking and lung cancer. Do you regard heart disease as a factor in the smoking-and-health issue?
MR. NUNLEY: Objection. What do you mean "a factor?"
Q. Do you understand the question?
A. A risk factor, I would assume.
Q. Yeah.
A. Well that's an interesting question because certainly in the literature over -- over the years it's -- it's been listed as a risk factor. However, some of the new evidence in the Mr. Fit study indicates that intervention does not necessarily indicate -- indicate that smoking is a -- is a major factor in cardiovascular disease. I think that there are many other factors in cardiovascular disease, and

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I don't think that it is necessarily defined as is certainly inherent in epidemiological studies, because you can't really pick apart the different confounding factors, it's not really defined what the importance of smoking is or the relevance of smoking is in those situations.

Q. Going back to Exhibit 1148, which is before you, has Philip Morris ever retracted the statement?

A. Excuse me. The Frank Statement?

Q. Yes, ma'am.

A. Not to my knowledge, no.

Q. Have you done any search to find out whether that's taken place?

A. Have we specifically retracted this -- the Frank Statement? No. However, I do think, as I indicated before, that subsequent statements supersede the Frank Statement.

Q. Are those statements in the predesignated documents, or are you thinking of other statements?

A. Well I -- I specifically referenced the warning labels on the pack, for example, so I think that future communications per se do have relevance to prior statements.

Q. How is it -- and if you've answered this, I apologize for asking it again because I didn't

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understand it -- how is it that the warning labels supersede the Frank Statement?

A. Well I think that what you have is a -- a history of communication, and it isn't that you come out and say that this supersedes that and -- and I don't think this statement was necessarily looked at that way. I think this was a position regarding a very specific point in time and event and it initiated a -- an action by the industry, and this was a description of that initiation of that action. That's still going on. So I don't see where this is really an issue where it needs to be retracted. We're still doing research.

Q. Let me show you what's been previously marked as Exhibit 408, which is a press release dated December 16th, 1957. Did you take a look at this as part of your work?

A. Yes.

Q. Do you know whether Philip Morris subscribed to or agreed with the statements in this press release as of the time it was made?

MR. NUNLEY: Well, Mr. Silberfeld, you may -- I'm sure you know on some things much more than I do. I don't know whether this was actually released or not, but to the extent your question

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represents that it was, I mean if you know that for a fact I'll -- I'll withdraw the objection; otherwise, I'll state that I think it assumes facts that to my knowledge are not in the record.

MR. SILBERFELD: I don't know whether it was released or not. That wasn't the question.

Q. The question is: Released or not, Dr. Ellis, did Philip Morris subscribe to the statements made in this release of December 16th, 1957?

MR. NUNLEY: Well you -- I mean your question was at the time it was made, and I took that to mean at the time it was issued.

MR. SILBERFELD: Well somebody wrote this. Whether it was published or not is another matter.

MR. NUNLEY: I agree with you. All I'm saying, Roman, is I think your question presumed it was published.

Q. Whether or not it was published, Dr. Ellis, did Philip Morris subscribe to the statements made in this statement, Exhibit 408?

MR. NUNLEY: Well I think that's overbroad. I mean do any and all statements made in it?

MR. SILBERFELD: Yes.

MR. NUNLEY: I think that's unfair. I

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think you need to direct the witness to a specific statement.

Q. It's four pages. Why don't you take a look at it with that question in mind.

A. Well let me say this: In 1957 I was maybe six years old, and I certainly don't have the personal knowledge to be able to -- to answer specifically, I think, what you're talking about.

It does state in this document that it -- it's from the Tobacco Industry Research Committee, it says it's comprised of representatives of manufacturers, so based on that I would -- I would think that somebody in the company was involved in this, but I have no personal knowledge of that.

Q. Remember, you're here today as the company, not as Dr. Ellis.

A. I understand that.

Q. And your age in 1957 is interesting, but not relevant.

MR. NUNLEY: Well I -- Mr. Silberfeld, I disagree with you on that. I mean I think you said at the beginning that Dr. Ellis is here as the person at the company most knowledgeable on these topics, and I think that's an appropriate designation. It happens to be the topics go from '54 to '94, so --

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Q. In your work related to litigation over the course of the last 18 months or so, Dr. Ellis, have you found any documents within Philip Morris that are inconsistent with the views expressed in this press release of December 1957?

MR. NUNLEY: Well again I object. Roman, I think it's unfair to just ask her in blanket on a document that's four or more pages long. I mean if you want to do this, you ought to go through it statement by statement. You --

A. And we could go through this statement by statement and -- and find any research report that might come to a different conclusion based on the design of that study. For example, some experiments indicate nicotine may result in a slight dilation rather than constriction, which certainly implies you're going to find another study that says it might result in a constriction, con -- constriction. So, you know, as you gain experimental knowledge, depending on the animal, depending on the experimental design, depending on the dose, you're going to get different results, and you're going to have documents and statements that reflect those differences.

The issue here is what is the overall scientific

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information as it progressed over time, not comparing one statement in one document to another statement in another document.

Q. So as you sit here today, you don't know whether Philip Morris subscribed to the statements made from this document as of the time December 1957.

MR. NUNLEY: Objection. When --

Roman, when you say "subscribed to," do you mean --

MR. SILBERFELD: Authorized.

MR. NUNLEY: Authorized. Has someone at Philip Morris read this and approved it?

MR. SILBERFELD: Yes.

A. Specifically I don't know that. Specifically what I do know is that we were members of -- of the group. I do not know what the process or who the individual was that might have been involved in this.

Q. Do you believe it was true as of 1957 that no substance has been found in tobacco smoke known to cause cancer in human beings?

That's at the bottom of the first page.

A. In 1957 I think that, based on my scientific interpretation of that, the question would then be were there any identified human carcinogens. I don't believe the tests in that designation were developed

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at the time, so I do believe that is a correct statement. That there are substances that can in experimental situations cause cancer in animals under certain conditions in certain doses, obviously yes. That's subsequent knowledge. But there is a designation by regulatory authorities between animal and human carcinogens, and at -- from 1957, that wasn't designated at the time.

Q. So to the extent that there was a belief expressed in this press release, whether it was released or not, that smoking was not a cause of cancer in humans, that would have been Philip Morris's belief at the time as well.

MR. NUNLEY: Well I object. I think that mischaracterizes --

THE WITNESS: Yeah.

MR. NUNLEY: -- just what the document says.

A. I think it very -- very pointedly provides the major points, as is stated, of the scientific knowledge. It -- it talks about substances in tobacco smoke, it talks about the animals exposed to massive doses of cigarette smoke have not developed lung cancer as a result, so it's stating the current state of the art in terms of the -- the studies. I

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don't think it's providing the overall conclusion that you alluded to.

Q. Take a look at the very first sentence, if you would. It says, quote, "Extensive scientific research now under way in the tobacco use and human health does not substantiate generalized charges against smoking as a cause of cancer...." Do you see that?

A. Yes.

Q. Do you believe that was a true statement as of the time it was made?

MR. NUNLEY: Well look, I think the doctor, in fairness, would require of you, Roman, to complete what that sentence says.

MR. SILBERFELD: Sure.

MR. NUNLEY: I mean it's a quote of what someone said.

MR. SILBERFELD: Yes.

THE WITNESS: Uh-huh.

MR. NUNLEY: Well let's finish it so the jury will have all the information in front of it.

MR. SILBERFELD: Let me reread the whole thing.

MR. NUNLEY: Thank you.

Q. "Extensive scientific research now under way

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into tobacco use and human health does not substantiate generalized charges against smoking as a cause of cancer, Dr. Clarence Cook Little, Scientific Director of the Tobacco Industry Research Committee, said today in his 1957 Report." Have I read that correctly?

A. Yes. And then he also said, "Broad and specific accusations and claims of harmful effects from tobacco have been made and the incorrectness or correctness of such statements must be proved, no matter how long or how difficult that effort -- the effort may be." So, you know, taken in the context of -- of -- of that, what he is doing here I believe, as I indicated before, is listing the progress of the studies at the time, and I don't think this is making a conclusion. It says that we must find out the incorrectness or correctness of such statements and continue the research.

Q. Was there a belief at Philip Morris in 1957 that smoking was a cause of lung cancer in humans?

A. In 1957?

Q. Yes, ma'am.

A. A belief at Philip Morris?

Q. Yes, ma'am.

A. I --

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Again, I was personally not there. However, I would have to say that I would be very surprised if there was a belief at Philip Morris that the evidence was not there for that belief to be -- to be at Philip Morris.

Q. Let me show you next Exhibit 409, which is another Tobacco Industry Research Committee release, approximately a year later, December of 1958. Do you see that, ma'am?

A. Yes.

MR. NUNLEY: Well just the -- the same colloquy we had before. Whether or not it was actually released I think is unclear from the face of the document.

Q. If I could turn your attention to page two, number four says, "The cause or causes of lung cancer remain undetermined." Do you see that?

A. Yes.

Q. And that "Definite conclusions are not warranted by the present state of knowledge about this complex disease." Do you see that?

A. Yes.

Q. And that "Laboratory" -- just above, "Laboratory and clinical findings have not proved a causal relationship between smoking and lung cancer." Do

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you see that?
A. Yes.
Q. Do you believe that as of 1958, that those statements represented the prevailing view at Philip Morris about those topics?
MR. NUNLEY: Objection, compound.
A. I believe these statements were -- are -- are the prevailing view in 1958, yes. That doesn't mean you can't find scientific studies that basically did show clinical findings that concluded or indicated a causal relationship. That doesn't mean you can't find that. However, it is true that laboratory and clinical findings have not yet proved. There was still a lot of discussion at the time about this. It is true that we still don't know what causes lung cancer. It is true that definite conclusions are not warranted at -- in the 1958 timeframe per se.
Q. As of 1958 Philip Morris believed, did it not, that smoking causes lung cancer?
A. I don't agree with that.
Q. You've not seen any documents that suggest that?
A. I do not recall anything that explicitly suggested that, no, that that was the prevailing knowledge within the company at the time. No.
Q. How about any belief within the company that

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smoking causes lung cancer, did anybody at Philip Morris in 1958 believe that?

MR. NUNLEY: Well I think that's very difficult question even for a 30.02(f) witness.

A. It could be that individuals had an opinion. It could be that they were expressing the potential for that conclusion. It would --

I would have to look at the specific situation and determine what data they were basing that -- that conclusion on.

Q. Let me show you what's been previously marked as Exhibit 304.

MR. SILBERFELD: Well I only have one of these, Chip. You don't get one.

MR. NUNLEY: You're punishing me for not having a croissant for you?

MR. SILBERFELD: Yeah, I am. I am.

(Service cart with pastries is pushed into deposition room.)

MR. SILBERFELD: Aha, punishment is over.

BY MR. SILBERFELD:

Q. Exhibit 304, Dr. Ellis, is another predesignated document. It is a report of a visit to the United States in April and May of 1958 by certain individuals from the British and American Tobacco

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Company. Do you recall this document?
A. In the predisignated documents, yes.
Q. If I could direct your attention to the second page of the document, the fifth entry from the top indicates a visit at Philip Morris on the 24th April 1958 with two individuals, A. E. O'Keefe and R. B. Seligman. Do you see that?
A. Yes.
MR. NUNLEY: I -- well I object, Mr. Silberfeld, to that characterization. It indicates an itinerary. Perhaps you're going to show the jury later in the document it indicates that indeed there was a meeting with these individuals, but I think to represent the itinerary of a non-Philip Morris document as proof that a meeting takes place I think is misleading, and I object.
Q. Do you know who A. E. O'Keefe was as of 1958?
A. I do not.
Q. Do you know who R. B. Seligman was?
A. Yes.
Q. Who is R. B. Seligman?
A. R. B. Seligman, not in 1958, but became later the vice-president of R&D, so he was a -- a scientist, a chemist in -- in 1958 at R&D.
Q. When you looked at this document and read it in

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preparation for today, did you do anything to try to find out who A. E. O'Keefe was?

A. No, I did not.

Q. How come?

A. I obviously have a limited amount of time, and I did not think that that was necessarily a particularly important parameter to look into.

Q. Turn your attention to the next page, if you could. Near the middle of the page there's a section entitled "quote, CAUSATION, close quote, OF LUNG CANCER." Do you see that?

A. Yes.

Q. And it says in the first paragraph, "With one exception...the individuals whom we met believed that smoking causes lung cancer if by, quote, causation, close quote, we mean any chain of events which leads finally to lung cancer and which involves smoking as an indispensable link." Do you see that?

A. Yes.

MR. NUNLEY: Let me just --

I object to what I think is an inappropriate introduction of clear hearsay by your reading of this document in a question. I move to strike.

Q. Did you read this statement when you reviewed the document?

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A. Yes.
Q. Okay. And from it did you gather that it was the opinion of A. E. O'Keefe and R. B. Seligman of Philip Morris that smoking causes lung cancer?
A. No.
MR. NUNLEY: Objection.
A. Very frankly, no, that was not my conclusion from reading this document.
Q. What conclusion did you reach?
A. That this was a general discussion, that -- that individuals were talking about what they think is a complex process and speculating about a potential role with --
And there's no real scientific -- this is not a technical document. Many of these individuals and -- are not necessarily specialists in this area. I think that this may be more of a situation analysis and discussion of work that maybe ought to be done in the future rather than a specific conclusion based on prior data. That was my conclusion.
Q. So you didn't reach the conclusion that the individuals at least from Philip Morris that were cited in the itinerary had a belief about whether smoking causes lung cancer?
MR. NUNLEY: Objection, improper use of the

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document. It's misleading to the jury. Move to strike.

A. No, I didn't. I -- I looked at this as a group of individuals that may have gotten together and said, "Well, maybe we ought to look at -- at this. Maybe -- and we're speculating about some different things," and perhaps getting together to discuss future work in the area.

Q. Is Dr. Seligman still alive?

A. Yes, he is.

Q. Is he still at Philip Morris?

A. No, he's not.

Q. Do you know where he is?

A. Not specifically, no.

Q. Did you make any efforts to talk to him about his participation in 1958 in any meeting with people from BATCo?

MR. NUNLEY: Same -- excuse me. Same objection. It's misleading to the jury. Move to strike.

MR. SILBERFELD: What's misleading about that?

MR. NUNLEY: The suggestion that there was any meeting in the first instance.

MR. SILBERFELD: Ah.

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MR. NUNLEY: And the suggestion, secondly, that if there was such a meeting, that this -- these people writing back to their bosses on their month-long boondoggle to the United States actually had such meetings, and if they had such meetings, could take, Mr. Silberfeld, what looks like meetings with over maybe 50 people and condense them into a single statement about what people believed. Do I think that's misleading? Do I think that's inappropriate use of this document? Absolutely.

Q. Well if it's misleading, Dr. Ellis, one sure way to find out would be to call Dr. Seligman. Did you do that?

A. No, I did not.

Q. There a reason you didn't do that?

A. Certainly I would not expect him to remember the specifics of a meeting in 1958, and based on my last meeting with Dr. Seligman, in his condition I would not expect him to remember that also. So I have no reasonable expectation of getting that information from Dr. Seligman.

Q. What -- what condition is that?

A. Well he is, obviously, an elderly man and -- and is not as sharp as he used to be, and I would not expect to be able to get that information from him.

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Q. Have you ever asked Dr. Seligman whether he believed that smoking causes lung cancer?
A. Specifically, no.
Q. At any time, whether he believed that now or at any time.
A. No, I have not. And I --
He is a chemist. I -- I would not necessarily think that he was well-versed in the -- in the data that would be important to that conclusion.
Q. So even if he believed that, you would discount that opinion because he's a chemist?
MR. NUNLEY: Objection. Speculation, lack of foundation.
MR. SILBERFELD: Go ahead.
A. I obviously do not know what he was -- what information he relied on. I look at this as highly speculative. And there is no technical data here, so this is not a scientific report. It's a discussion, and I think it was potentially looked at -- looked at by these individuals as a planning document for future work.
Frequently in research you have to come up with a hypothesis, and I really look at this as a potential hypothesis rather than a conclusion based on the data available at the time.

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Q. On what basis do you say that this is a hypothesis or a planning document?

A. On the basis that these individuals appear to have gotten together, and on the basis that there is this discussion and there is a lot of back and forth about different beliefs. I think that -- perhaps that this was a -- a document that basically reflects the discussion and perhaps the focus of the biological research for the future, and that's how I took it, and not as a conclusion at all.

THE REPORTER: Off the record, please.

(Recess taken.)

BY MR. SILBERFELD:

Q. Dr. Ellis, one of the documents that was predesignated today was a -- an Exhibit No. 425, --

MR. NUNLEY: Thank you.

Q. -- which is an Arthur D. Little document dated March 15th, 1961. And I'll represent to you that this came from the files of Philip Morris, even though it doesn't say Philip Morris on it necessarily.

Under paragraph one it reports that "There are biologically active materials present in cigarette tobacco.

"These are: a) cancer causing.

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b) cancer promoting.

c) poisonous.

d) stimulating, pleasurable, and flavorful."

With respect to that statement, do you believe that that was the view at Philip Morris as of 1961?

MR. NUNLEY: Well let me --

Mr. Silberfeld, you have said this came from Philip Morris's files. It may indeed have a Philip Morris production number on it, but I note it's an Arthur D. Little document, it says "L & M - A PERSPECTIVE REVIEW," and I believe, so the jury will be as informed as we are, that it has two stickers on it that I believe are probably exhibit stickers, although I -- it's difficult for me to tell. I'm referring to what's on the right near the top and right near the bottom. And it is my belief, although I'm not certain, this is a document that has been introduced in previous litigation that has made its way into Philip Morris's files as an exhibit in a case. So to the extent you want to suggest by your question that these -- this was in Philip Morris's files' possession in March of 1961, I think that's misleading and I want to correct that for the jury.

MR. SILBERFELD: Thanks for your testimony on that, counsel.

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MR. NUNLEY: I'd just counterdesignate it to yours, if you would.

A. This is -- was a predesignated document and -- and that was the first time I had ever seen this before, so I certainly don't think it was a major factor in the research and development at Philip Morris, thinking over the years, obviously. So therefore, if your question is does this reflect Philip Morris's information at the time, I have no reason to believe that it does.

Q. Is it inconsistent with or contrary to Philip Morris's position at the time; that is, as of 1961?

A. Well again, as -- as I've said before, we can go back and --

These are very general statements and -- and broad statements that --

And there's no data, there's no references, there's no way to determine on which -- on what they were based. Anybody can have an opinion about something and -- and say this might do this and somebody can say this might do that, but the bottom line here is is that this isn't, I think, representative of what was in the files of Philip Morris at the time.

Q. Okay. Let me show you what's been marked as

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Plaintiffs' Exhibit 92.

MR. NUNLEY: Thank you.

Q. This is a letter dated September 25, 1963 from a Peter Waltz, W-a-l-t-z, to Mr. H. Wakeham, vice-president in charge of research, Philip Morris. Do you see that?

A. Yes.

Q. Have you seen this document before today?

A. Yes.

Q. One of the documents you looked at?

A. Yes.

Q. Is it fair to characterize this as a report to Dr. Wakeham about, at the bottom of the second page, the effects of nitrosamines, for example?

A. I think what this report represents is really a trip report, so it reflects some information that Peter Waltz found or heard at a meeting in Hamburg in 1963, a public meeting.

Q. As of 1963, do you know who Peter Waltz was?

A. He, as it says here, was at FTR or Fabriques de Tabac Reunies. He was, it says, chief of the scientific department, and it looked like he was the administrative director of that department.

Q. Was FTR in 1963 a part of Philip Morris?

MR. NUNLEY: Objection, foundation.

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A. I don't have that history off the top of my head, so I could not tell you that.
Q. Was FTR at any time a part of Philip Morris?
A. Oh, definitely. It is now.
Q. But you just don't know if it was so in 1963.
A. Exactly.
Q. All right. And do you know what Mr. Waltz had by way of background in terms of technical expertise? Was he a doctor, a scientist, a chemist? What?
A. My recollection, I believe, is that he was an M.D., I think.
Q. And insofar as the statement at the bottom of page two is concerned, quote, "Nitrosamines are the most potent carcinogens known," close quote, was that statement true and believed by Philip Morris as of 1963?
A. I think that this represents some information that was presented in a meeting. I'm -- I don't think it necessarily represents the -- the general knowledge of Philip Morris in 1963. Obviously that's the representation of this document. It was a -- a trip report per se, and this was external information.
Q. "External" meaning coming from outside the

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company?
A. That's correct.
Q. What was the belief within Philip Morris as of 1963 as to whether or not nitrosamines were carcinogenic?
A. Well in 1963 it wasn't specifically known what nitrosamines were present in -- in tobacco smoke, it wasn't specifically known how much, and so therefore the relationship is -- was not necessarily known relative to smoking. Nitrosamines and the study of nitrosamines progressed extensively in the '60s and '70s, but it wasn't until the '70s, actually the early '70s, I believe, that one of the tobacco-specific nitrosamines was identified, and later on in the '70s, the latter '70s, when NNK specifically was identified. So this was a general statement, not necessarily relevant to smoke at the time.
Q. With respect to this statement, let's just review for a moment what was known and not known --
A. Uh-huh.
Q. -- as of '63. Was it known that nitrosamines were in tobacco products or tobacco smoke?
MR. NUNLEY: Objection, vague.
A. It was known that certain nitrosamines were in

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tobacco smoke per se, the volatile nitrosamines, and there was a lot of work in -- with very crude assays looking at that. So there was no real ability to get a -- a good quantitative determination.

Q. Okay. Was it known that nitrosamines were carcinogenic in 1963 at Philip Morris?

MR. NUNLEY: Objection, vague.

A. I think that the work in that period of time was just beginning in terms of some of the better studies relative to nitrosamines, and I think a lot of those related to some of the mouse skin-painting studies in -- in particular, so I think the -- the information was evolving.

Now this statement, again there's no scientific reference per se. I don't know what they were basing it on specifically.

Q. Was it believed at Philip Morris in 1963 that nitrosamines were carcinogenic?

MR. NUNLEY: Objection, vague.

A. Again, I -- I have to say that I don't think that necessarily in 1963 that could be a definitive statement for all nitrosamines per se.

Q. How about for any?

A. There may have been some evidence at the time that there is -- there was a -- a biological response

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to nitrosamines in certain studies. That doesn't mean that they all are -- that they all are the same and that they all would do the same thing in the same -- under the same conditions. So it -- it really was just evolving at this time, and not specific to tobacco smoke.

Q. Was it believed at Philip Morris in 1963 that nitrosamines were the most potent carcinogen known?

MR. NUNLEY: Objection as to form. Do you mean had Philip Morris, as the -- as an entity, come to that conclusion, or do you mean was there someone in the employ of Philip Morris who may have held that as a personal opinion?

MR. SILBERFELD: Either one.

MR. NUNLEY: Well as to either one I think it's vague. I don't think this witness really has an obligation to talk about what individuals may have known.

MR. SILBERFELD: Well she's got an obligation to talk about whatever she knows. If she doesn't know, she can say so.

MR. NUNLEY: I couldn't agree with you more.

MR. SILBERFELD: Okay. But as to the company, if you know, you're obligated to testify as

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to the company, ma'am.

A. Well let me -- let me put this document in -- in context. I think this document represents a review of an outside meeting where some data in general was presented, and I refer to the page three, paragraph one, some very general data on nitrosamines per se.

Nitrosamines are in many different things. And the review was presented such that, as I said before, there might be some planning of future work for the company to do.

I don't think there was a conclusion at the company in 1963 that nitrosamines in smoke were carcinogenic, no. I think that this -- (clearing throat) excuse me -- represents a -- a document of bringing information into the company to plan future work on things that we might look at.

Q. Take a look, if you would, at the conclusion on page six of the document. It says, quote, "As a whole one can say that the Nitrosamines are very potent carcinogens, potent mutagenes, that they have a very good dose-response relationship, an astonishing relation between structure and organotropic action, that their effect on the chemical structure of the attacked organism is better known than for most other carcinogens." Do you see

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that, ma'am?

A. Yes, I see that paragraph.

Q. Does that paragraph represent the state of knowledge at Philip Morris in 1963 on the subject of whether or not nitrosamines are carcinogenic?

A. I think that this, again, represents some outside information that was brought into the company that basically indicated that this was a class of compounds that might warrant further study. I don't think that Philip Morris necessarily had data, specific data on which to base the judgment that you're stating.

Q. So that this would have been new information to Philip Morris as of the time.

A. I believe it was information that was brought from the meeting, yes. I'm not saying it was entirely new, but I think it was additional information that he -- he -- he supplied, and -- and maybe supplied it such that -- in such a way as to propose further study, which obviously was done.

MR. SILBERFELD: Let me have marked as next in order an interoffice correspondence on letterhead of Philip Morris dated October 11, 1963, from A. Bavley, B-a-v-l-e-y, to Dr. H. Wakeham. It bears Bates number 2022242315 through 2319.

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Source: http://www.industrydocuments.ucsf.edu/docs/jkxd0001

(Plaintiffs' Exhibit 4858 was marked for identification.)

BY MR. SILBERFELD:

Q. You've seen this before; have you not?

A. Yes.

Q. As of 1963 who was A. Bavley?

A. An individual that worked in R&D in Richmond.

Q. And Dr. Wakeham was the head of research at the time?

A. Yes.

Q. On the last page under "Summary" there's the statement, quote, "This method indicates considerable amounts of nitrosamines in smoke. There is 6 times as much from burley cigarettes as from bright cigarettes. Most of them occur in the non-volatile, water soluble fraction of smoke." Have I read that correctly?

A. Yes, you read it correctly.

Q. Was that conclusion, as of October 1963, new information at Philip Morris?

MR. NUNLEY: Which -- which conclusion exactly? You read -- I mean there's several --

MR. SILBERFELD: That there are considerable amounts of nitrosamines in smoke.

THE WITNESS: Well --

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MR. NUNLEY: Well that's --

THE WITNESS: -- first --

MR. NUNLEY: I'm sorry, Dr. Ellis. I'll just object. This -- the document uses the term "indicates." You've referred to it as conclusion. I think that's misleading. Objection. Move to strike.

MR. SILBERFELD: Go ahead.

A. That was precisely what I was going to point out.

Q. I knew you would, but --

A. No. I'll go further than that because I -- I remember in specifically reading this that I did -- did go into this in -- in quite an amount of detail because I was specifically surprised at the microgram -- microgram quantities of nitrosamines presented on -- in page two under "TPM." I found that quite surprising.

The situation relative to this method is -- is that if you notice in toto the document and you start with -- there's no page number, but it's Bates number 2022242317, there were, in the first paragraph there, attempts to detect nitrosamines in smoke, and these were attempts using their gas chromatographic behavior, so that was a very highly specific method

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at the time. And if you will see that this indicates that these five nitrosamines are not present in cigarette smoke, and basically this was a very specific method, and since they couldn't detect them with that method, they went to a very general method, a color test. And indeed, these color tests are not specific so they pick up other compounds.

So what you're actually detecting here are not nitrosamines necessarily, or are a variety of other substances with the same sort of functional group that is specific to this -- this color test. So in reality, this was a document that is based on this method and that is what it does state, it is this method. This method indicates that, however, subsequent there was a thermal energy analyzer that was developed in the late '70s that obviously has become the method of choice for detecting nitrosamines, and obviously has superseded this document completely.

Q. And reached a different conclusion about the presence of nitrosamines?

A. Certainly has reached a different conclusion about the amount of nitrosamines per se, yes.

Q. Well let's --

A. And the quantitative --

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This is not a quantitative study here at all. This isn't even a qualitative study.

Q. What conclusion has been reached based on the new technology about the presence of nitrosamines in tobacco or smoke?

A. Well the thermal energy analyzer is a much more specific method that can analyze nitrosamines, and the levels are in the parts per billion range, nanogram range, and certainly not at the microgram range as indicated here.

Q. So the nitrosamines are present, they're present in smaller amounts; is that what you're saying?

A. That's correct.

Q. And is the thermal energy analyzer able to detect nitrosamines by specific types of nitrosamines as well?

A. Yes.

Q. Okay. And how many different types of nitrosamines are present in tobacco smoke?

A. Well it --

The way the -- the study is designed, it depends on how -- what sample you're looking at. As you can see here, there's a -- there's an extraction procedure, and you might want to look at the nonvolatile nitrosamines or you might want to look at

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the volatile nitrosamines. Typically the volatile nitrosamines are relatively efficiently filtered out by the cellulose acetate filter. Most of our work has specifically focused on the nonvolatile nitrosamines which are associated with the TPM or tar of the cigarette. Obviously, as you reduce tar in the cigarette, you're reducing the nitrosamines even further.

Q. If I could direct your attention to the second page of Bavley's document to Dr. Wakeham, it talks about "CARCINOGENIC ACTIVITY OF NITROSO COMPOUNDS IN THE RAT." Do you see that? It looks like --

A. Yes.

Q. -- this (displaying exhibit to witness). Do you have it?

A. Yes, I have that.

Q. Did Philip Morris understand as of October 1963 that certain nitrosamines were associated with tumors in animals?

MR. NUNLEY: Objection, I think that's vague.

A. This table obviously represents what I would suspect is a literature review, as indicated, and they're indicating total dose in grams per kilogram. That's incredible, a gram of a nitrosamine is an

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incredible amount. And I think that you have to look at the total -- total amount here in terms of making the evaluation of what this implies. There were obviously not, even in this memo, grams of nitrosamines identified in smoke.

Q. But this implies, does it not, this particular page, that at some dose, nitrosamines are capable of producing tumors in laboratory animals?

A. I think the evidence today indicates that -- certainly that that has been shown in experimental study.

Q. And that's true as of 1963 as well.

A. I think that in 1963 the data and the methodologies to show those results were not as sophisticated as they are today. And obviously if you have to take a gram per kilogram, and obviously these animals weigh more than one kilogram, so you're looking at multiple grams of material, that is not relevant to any -- any real situation. So I think that they have to be -- you have to take this in the context of the design of the experiment and what was done at -- and known at the time.

Q. Would you regard this information that we're talking about here on page 2022242316 as a warning flag, if you will, that nitrosamines are capable of

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producing tumors in laboratory animals?

MR. NUNLEY: Objection, vague.

A. I think that, as the previous document indicated, that what this document also indicates is that there was work being done internally and externally on the topic of nitrosamines, as nitrosamines relate to many other things including the rubber industry and -- and even bacon and cured meats. Nitrosamines were being looked at, nitrosamines were being studied, and I think that Philip Morris recognized that this was an area that we needed to study and we did, and I do think that -- that that's what this document represents.

Q. Okay. I show you what's been previously marked as Exhibit 166. It is a memorandum dated October 24th, 1963, from Dr. Wakeham to Mr. Cullman; right?

A. Yes.

Q. And Mr. Cullman in 1963 was who?

A. Boy, I don't know what his specific title was in 1963, but he was certainly a senior executive in Philip Morris, yes.

Q. If not the chairman?

A. If not the chairman in 1963.

Q. And --

MR. NUNLEY: Just so we're clear there,

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chairman of Philip Morris Incorporated, the domestic tobacco unit.

MR. SILBERFELD: Right.

Q. It says in the first paragraph, quote, "We now have accumulated a good deal of documentation on this subject," referring to the elements in smoke, among other topics. And he goes on to say, "Rather than to subject you to all this I will present here our considered judgment in the matter." Do you see that?

A. Yes, I do.

MR. NUNLEY: Objection to the characterization of the document.

Q. Do you accept as true that this document, as of October 1963, represents the considered judgment of Philip Morris on the topics covered by this memorandum?

MR. NUNLEY: Objection, vague, overbroad, unfair to the witness.

A. I would characterize this document much like I had characterized the last -- last several. And it's clear, it says that "...you have requested a, quote, technical forecast...," so this is looking to the future. This isn't a conclusion at all, and it is really what areas should we be focusing our attention on based on the information that's available now. It

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is not at all a conclusion at this time.
Q. Do you regard this as a forecast for work to be done in the future?
A. That's specifically what it states.
Q. Where?
A. "You have requested a 'technical forecast....'" First line.
Q. Read the rest of it.
A. "...outlining those areas where the cigarette industry might be most subject to criticism and suggesting those elements in smoke which might be most accused by either the medical profession or exploited by our competitors."
It's a technical forecast of the areas that we need to do research in, absolutely.
Q. Did Philip Morris believe in 1963, as indicated on page two under "Nitrosamines," that "The lower, paren, simpler, close paren, nitrosamines are highly carcinogenic in the bioassay tests?"
MR. NUNLEY: Objection. Mr. Silberfeld, your question, I believe, was did -- does Philip Morris or did Philip Morris believe as indicated there. I think what's indicated there is just a reference to the Waltz memo we've already looked at, which was a report of an outside meeting, so I think

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your question is misleading as phrased.

MR. SILBERFELD: Okay. Go ahead.

A. The whole paragraph says, "A conference of European tobacco researchers was held recently in Hamburg to discuss the nitrosamines in cigarette smoke as possible causative factors. Peter Waltz sent us a good summary of this meeting. The lower, parentheses, simpler, nitrosamines are highly carcinogenic in the bioassays."

Again, that does reference the previous document we discussed. I think it is, as those other documents were, a representation of what was known outside in the literature and again was a technical forecast of the kinds of work that we needed to pursue and was not a conclusion.

Q. How about the paragraph above concerning polynuclear hydrocarbons, was it the considered judgment of Philip Morris in 1963 that those substances are the first known carcinogens and are present in cigarette smoke?

MR. NUNLEY: Well could we have --

Again, the doctor, in fairness, would suggest you finish the sentence.

Q. "...to the extent of about one hundred millionth of a gram per cigarette."

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Was that the judgment of Philip Morris as of 1963 or not?

A. I --

Again, I think that this reflected what was known about these compounds and was a -- a planning document for future research. It was not a conclusion. It says also, "We now have an active program seeking to reduce or eliminate these substances...." It says, "They have received considerable attention by medical researchers." I think that -- I think that this is a plan for future work.

Q. Well a fair reading of that paragraph, Dr. Ellis, is that it was known that those substances are carcinogens and the program in place is to reduce or eliminate the substances from smoke; isn't that right?

MR. NUNLEY: Well I -- I think it's for the jury to determine what's a fair reading of that, and I think without reference to the dose, you don't get a fair reading or fair question.

MR. SILBERFELD: Go ahead.

A. It states that they're the first known carcinogens -- that has, you know -- that -- that was -- that was basically a fact of the time -- to

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the extent of about one hundredth -- hundred millionth of a gram per cigarette. I think that puts it in context, that here we're talking about something that is present in very, very, very small quantities, and yet there was an active program planned to reduce or eliminate the substances from smoke.

Q. Take a look at the last page, if you would, under paren (3), last page, concerning "The Cardiovascular Effects." Do you see that?

A. Yes.

Q. It says, "The Cardiovascular Effects in smoke are believed to be mainly due to nicotine and have been thoroughly explored in literature and conference."

Stopping there for a moment, did Philip Morris believe in 1963 that nicotine had cardiovascular effects?

A. Well I think -- I think that the data on nicotine -- and -- and as I've indicated before, nicotine has been studied for a hundred years and its autonomic nervous system effects have been under thorough study outside, and as it says here, it's been thoroughly explored in the literature, so there was a lot of knowledge about that, there was no

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specific need for Philip Morris to pursue nicotine effects per se, and that -- that information, I think, was -- was widely available.

Q. And understood by Philip Morris as of this time.

A. I -- I think that information at the time, to the extent to which it was known at the time, was understood, yes.

Q. It says in the last sentence before the references, "If forced to, we could produce a fairly tasty low nicotine product." Do you see that?

A. Yes.

Q. Have you seen any evidence to indicate that in fact an effort was made to produce a fairly tasty low nicotine product?

A. In fact we did do a number of studies early on in Richmond looking at the extraction -- actually ammonia extraction of nicotine from tobacco filler. That was the first methodology used to denicotinize tobacco. However, when you do extract -- or extract nicotine from tobacco, you extract many things, and it was not tasty. As you also well know, we went to further try to more specifically remove nicotine with our denic process. So yes, I do think we did do work to follow up on that.

Q. Let me show you Exhibit 129. This is a February

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1964 Philip Morris Research Center document entitled "SMOKING AND HEALTH, SIGNIFICANCE OF THE REPORT OF THE SURGEON GENERAL'S COMMITTEE TO PHILIP MORRIS INCORPORATED." Do you know who prepared this document?

A. Well it's signed by H. Wakeham, so I would reasonably conclude that Dr. Wakeham was involved in the preparation.

Q. Under the section "INTRODUCTION AND SUMMARY" on the fourth page --

Are you on the same page?

A. Yes, I am.

Q. All right. All right. In the second paragraph Dr. Wakeham writes -- or Dr. Wakeham and his colleagues, whoever helped prepare this, write, "The onus of proof has been moved by the report," referring to the Surgeon General report, "from its usual position with the industry's accusers to the tobacco industry itself. Meeting this challenge affords Philip Morris a splendid opportunity to gain a competitive edge through effective technical activity. Positive programs to cure ills cited in this report, whether real or alleged, are recommended, as little basis for disputing the findings at this time has appeared."

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Have I read that correctly?
A. That's what it says, yes.
Q. Did Philip Morris believe as of 1964 that smoking caused lung cancer as cited in the Surgeon General's report of that year?
A. Based on my -- my read of this, it says, "Positive programs to cure ills cited in this report, whether real -- real or alleged...," I think that, again, the 1964 report was a compilation of largely epidemiological studies or studies that were clinically related. The kind of study required or necessary to prove scientifically a cause and effect were not there. I think that what this says is that -- that basically what we recommend are studies to pursue this, real or alleged or whatever, that we need to have a basic understanding of what was going on here.
Q. Did Philip Morris believe as of 1964 that the findings of the Surgeon General report could be disputed or that a basis for disputing them existed?
MR. NUNLEY: Objection, I think that's vague in that you're referencing findings of a report without descriptions of which specific findings.
MR. SILBERFELD: The finding that smoking causes lung cancer, ma'am.

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MR. NUNLEY: That specific finding.

MR. SILBERFELD: Yes.

A. It says here "...as little basis for disputing the findings at this time has appeared." Obviously I don't think that they -- the issue here was disputing, I think the issue here was understanding.

Q. Are you saying that as of that time in 1964, that Philip Morris had no basis for disputing the findings of the Surgeon General of that year?

A. The -- the -- the issue was that -- that --

Well in a scientific study, the -- what you have to have is a positive study with a -- with an effect. Okay? So the bottom line here is that there was a lack of evidence, there was a lack of scientific, controlled, experimental evidence, and so in that sense you didn't have the specific data required. Okay? And it's -- it's --

Proving a negative is very difficult in science.

Q. And then that's how you interpret the language in Dr. Wakeham's memo.

A. No. What I'm --

Q. How do you interpret that, ma'am?

A. What I'm trying to say here is basically that I don't think that this -- what they're saying is there was -- there's little evidence or little basis for

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disputing. I don't think that's the issue. I think the issue here is meeting the challenge. We need to have --

We have an opportunity here to have effective technical activity. I think that that would gain an understanding of what was going on and thereby round out or provide additional evidence and information about the current situation. I think the issue here was there was limited knowledge. There was only a piece of the picture available.

MR. SILBERFELD: Let me have marked as next in order a multi-page document entitled "FTR RESEARCH REPORT 1962 to '66," it bears Bates number 1001808680 to 8722.

(Plaintiffs' Exhibit 4859 was marked for identification.)

MR. SILBERFELD: I think I handed over to somebody my highlighted copy.

MR. NUNLEY: You may have it back.

MR. SILBERFELD: I'll trade you.

The highlights just make it go faster, is all.

BY MR. SILBERFELD:

Q. Did Philip Morris, in 1964 and '5, believe that the Surgeon General's report of 1964 was a very complete and well-made literature review on tobacco

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smoke and its biological effects?

THE WITNESS: Are you reading from --

MR. SILBERFELD: Yeah, I'm reading from the bottom of the third page.

THE WITNESS: Bottom of the third page. Okay.

MR. SILBERFELD: Did Philip Morris believe that in 1964 or '5.

THE WITNESS: Yeah.

MR. NUNLEY: I'm sorry, Mr. --

Are you saying numbered report, numbered -- oh.

MR. SILBERFELD: No, just the third page.

MR. NUNLEY: Third page in.

THE WITNESS: Yes, the bottom paragraph.

A. I think that it was a -- a thorough review of -- of the information available at the time.

Q. And the company believed that at the time, not --

MR. NUNLEY: Well let --

Q. -- not --

When you say you believed it, you're not speaking as Dr. Ellis now, you're speaking as the company?

MR. NUNLEY: Well let me just say one -- one thing, Mr. Silberfeld. This is an FTR research

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report. I don't know whether, in nineteen sixty -- I don't know what its relationship was to Philip Morris in 1964, and I don't know whether your question is premised on the belief that it was part of Philip Morris at that time. If it is, I'd object because it assumes facts to my knowledge not in the record yet. I mean FTR may well have been, I just don't know. So on that basis I'm going to object to the extent that you suggest this reflects Philip Morris's knowledge in '64.

MR. SILBERFELD: That's really the question for you.

A. The question is -- or basically my answer relative to that is that the Surgeon General's report certainly discussed a lot of the work that was available at the time. I'm not going to represent that everything was represented in that report, that, you know, it was exhaustive per se. There may have been other studies that weren't mentioned in that report. It represented, I think, though, and referenced, I think, many of the studies that were available at the time.

Q. And was it a balanced and well-done review of the literature on tobacco smoke and its biological effects?

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A. I -- I think that it was a -- a review of the literature from the public health perspective. And that is the goal of that committee, was to look at the review -- and review the literature available to determine if there was sufficient data available to inform the public relative to smoking, and I think that was the purpose of the document. I don't think the purpose of the document was to be a complete literature review to completely represent everything and balance the discussion of the topic. Again, it was a public health document.

Q. From your review of the literature created within Philip Morris in the '60s, Dr. Ellis, did the company engage in research involving inhalation experiments in animals?

A. Yes.

Q. And what conclusions were reached in the 1960s about the effects of inhaled smoke on laboratory animals?

MR. NUNLEY: Are you representing a specific report or just in general?

MR. SILBERFELD: In general.

MR. NUNLEY: Objection, vague.

A. Well in the 1960s, as I've discussed before, the inhalation methodology was not well developed and

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frequently produced results that were more representative of pathogens in the air supplied to the animals over a long period of time than in the smoke per se. Some of the studies, the specific study that I -- I think is most definitive in that period of time is the Hazelton cynomolgus monkey study, and the conclusions from that is that there was no fundamental difference from the control and the test animals.

Q. To the extent that there are documents produced by Philip Morris that show lung effects from inhalation experiments, have you reviewed those in the predesignated set?

A. Oh, absolutely.

Q. Okay. And do you have comments about those --

MR. NUNLEY: Objection to form.

Q. -- individually that we could go over?

A. I would be happy to specifically comment. I --

You know, there's a huge volume of data, of studies that were done.

Q. Okay. Let me show you Exhibit 168, --

MR. NUNLEY: Thank you.

Q. -- which is a memorandum from Dr. Luchsinger to Dr. Wakeham and others dated August 1966. You've read this; have you not?

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A. Yes, I have.
Q. Okay. And it reports on a visit to the Imperial Cancer Research Foundation?
A. Yes.
Q. And it --
Near the bottom of the first page it indicates, in the fourth line from the bottom, that "six of 200 smoking mice have developed lung tumors by histological techniques." Do you see that?
A. It -- it states that, yes.
Q. Okay. Did you evaluate whether those findings were significant in terms of whether smoke can cause tumors in smoking mice?
MR. NUNLEY: Well I'd object. There's a good bit more to this experiment, --
THE WITNESS: Yeah.
MR. NUNLEY: -- Mr. Silberfeld, than you're letting the jury know as you ask the question. I think it's misleading.
MR. SILBERFELD: Well you'll have plenty of opportunity to ask your own questions.
MR. NUNLEY: Well I agree. I understand that. But the jury is going to sit through a good bit of this and may forget some of the questions you ask by the time I get to ask mine, and that's why I

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think that the rule of law is you have an obligation to ask questions that are fairly based on the document. I don't think yours does that.

MR. SILBERFELD: Okay.

MR. NUNLEY: And I don't think you can say, well, I may mislead, but you can clear it up when you get the chance.

MR. SILBERFELD: I don't agree with that characterization at all, any more than any of your comments are intended to be misleading.

Q. Dr. Ellis, do you have my question in mind?

A. Yeah. Let me just briefly, because I did notice that sentence and then I did --

As I recall, that this was smoke inhalation alone or following repeated infection with flu viruses, and obviously, therefore, was -- was not a specific smoking experiment. There were other -- other factors involved.

Indeed, this sentence that you refer to says six of 200 smoking mice developed lung tumors. Of interest to me is what the other groups developed, and it certainly doesn't state how many tumors were produced in the control groups.

I believe I have seen, either in this document or in other documents, some data that indicated that

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there was no difference of substance relative to this. As a matter of fact, I think I recall that smoking may have actually -- smoking with the virus may have actually had a lower incidence of -- of tumors. So I would very much want to caution that this, again, is a document that does not have all of the data associated with it.

Q. Are you familiar with Project 6900?

A. Yes.

Q. What is Project 6900?

A. Well I think Project 6900 was a -- a project in Richmond that was in existence very early on, and the group of people that were involved in that project did review the literature and did contract out studies to respond to some of the literature over that period of time in the area of smoking and health.

Q. Let me show you Exhibit 11. Got 12 of these for some reason.

Is this a report on the Project 6900 physiological studies?

A. Yes.

Q. Dated October 1966?

A. Yes.

Q. And you read this before?

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A. Yes.
Q. If I could direct your attention to page four, the number four at the bottom of the page, do you see that?
A. Uh-huh, yes.
Q. Under "Long-Term Primate Inhalation" -- do you see that section?
A. Yes, I do.
Q. It reads, does it not, "Smoke inhalation has been completed and all animals have been sacrificed. The gross examination of the lungs indicates some emphysema in the smoking group, even though the physiological measurements did not reveal any differences between the smokers and the nonsmokers?"
A. Uh-huh.
Q. What types of animals are these?
A. I again assume that this, because that was a primate study at the time, was the cynomolgus monkey study done at Hazelton. Indeed, again, this is a situation where this is a status report, probably right as the animals were beginning to be evaluated. I don't see reference here specifically to the control groups; however, the final report does report on the total study per se, and the control group also had evidence of -- of lung -- lung issues with -- in

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terms of bronchitis and/or emphysema. In other words, there was no difference between the control and the test animals in that study.

Q. This report is different than the final report?

A. Oh, absolutely.

Q. Okay. When was the final report, what year?

A. As I recall, it was probably in '66 or '68.

Q. Well this one's dated '66.

A. Right.

Q. So you believe the final report came after this?

A. Oh, it would probably -- well, probably be in that vicinity. Maybe it was '67. I --

Q. And --

A. Obviously, according to this, there was -- they were in the process of evaluating the animals. The inhalation was completed.

Q. And you believe the final report showed that as regards to primates, there was no difference in terms of the production of emphysema in the lungs of the control group or the study group?

A. The control group exhibited the same symptoms.

THE REPORTER: We have change tape. Off the record, please.

(Discussion off the record.)

BY MR. SILBERFELD:

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Q. Dr. Ellis, let me show you what's been previously marked as Plaintiffs' Exhibit 1517. It's a memo from Dr. Wakeham to Mr. Goldsmith. Do you see that?

A. Yes.

Q. January 1969.

Was Mr. Goldsmith in January of 1969 the president or CEO of the company?

A. He was certainly a senior executive. His precise title in 1969, I -- I haven't memorized the organizational charts.

Q. But in any event, in 1969 he was a high-ranking official --

A. Yes.

Q. -- at Philip Morris?

A. Right.

Q. And Dr. Wakeham was the director of research?

A. He was in charge of research and development, I believe, at the time.

Q. Okay. As of 1969 Philip Morris understood, did it not, that smoking had a certain health effect on pregnant women in terms of producing smaller babies?

MR. NUNLEY: Objection, vague.

A. I think what this memo represents is that there was a study that basically indicated -- or the

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conclusions of that particular study were that smoking in pregnancy supports previous conclusions that smoking mothers produce smaller babies. I don't think that necessarily implies a health effect per se.

Q. How about the first sentence of the next paragraph.

A. "The position of the medical people is that smaller babies suffer detrimental effects all through life. For example, in identical twins, the smaller one at birth has lower intelligence test scores at age 10."

When I read this, this memo, I -- my thoughts on this were that in the case of identical twins, frequently -- frequently what is happening -- happening is that the smaller baby, or even in premature births, the smaller baby is not getting the same nutrients or is competing for nutrients per se. I think there's a different mechanism, different issues associated with birth weight when you're talking about multiple births than when you're talking about other situations where smaller babies are produced.

Q. So from this did Philip Morris conclude as of 1969 that smoking mothers did or did not produce

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smaller babies?

A. I think --

MR. NUNLEY: Objection, vague.

A. I don't think this was a conclusion, I think this was a report of a study. Dr. Fagan's summary of these studies is attached. I think that this reflects a continuing review of the literature on certain topics.

Q. Did Philip Morris ever reach a final conclusion as to whether or not smoking mothers produce smaller babies? Up to today.

A. Final conclusion in terms of -- I -- I --

Fundamentally I think that, again, the role of the Surgeon General's reports over the period of -- of years, it is the public health community that makes judgment relative to lifestyle issues, and I think that what this reflects and what Philip Morris was doing here was looking at the literature, reviewing the literature, making recommendations on research to be followed, and looking at how it -- it relates to the product and what could be done. I think that's what all these documents reflect per se.

I don't think it's the business of Philip Morris to make public health judgments per se.

Q. Whether it is or isn't, was Philip Morris

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satisfied as of 1969 that the phenomenon of smaller babies and smoking mothers was a true phenomenon that in fact did occur?

A. I don't think that this indicates that. I think that this indicates that there was a study, and here's the data.

Q. And Philip Morris knew before 1969 of other studies that conclude the same thing; namely, that smoking mothers produce smaller babies.

A. It states that there were previous conclusions, which means that there were other conclusions in the literature, public knowledge, obviously, available to -- to all.

Q. "Public knowledge" meaning to the lay public?

A. There were scientific studies that, yeah, was public -- public knowledge. 1969, Surgeon General's reports were being -- obviously there was one in 1969. I think that what this is indicating is that there were scientific studies that were available, and prior to 1969, on this topic.

Q. And would you regard smaller-birth-weight babies as a health effect?

A. As I indicated before, no, not necessarily.

Q. Possibly?

A. It depends on the circumstances. It depends on

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why they were smaller, as I indicated.

Q. Let me show you what's been previously marked as Exhibit 1516. This is a memo from Dr. Osdene to Dr. Seligman dated April 3rd, 1969, the subject is "Health Implication of Gas Phase." Do you see that?

A. Yes.

Q. It indicates in the second paragraph from the bottom, in the third line, "The single most toxic compound in gas phase (present in high concentration) is carbon monoxide." Do you see that?

A. Yes, I do.

Q. Did Philip Morris believe as of 1969 that carbon monoxide was a health concern?

A. Fundamentally, carbon monoxide is -- is a substance that's the result of incomplete combustion, whether it's from your -- your furnace or cars or -- or present in cigarette smoke. It's -- it's -- it's in the atmosphere and I think that people are exposed to it all the time. Obviously carbon monoxide, if you lock yourself in your car garage and have the motor running, is -- is toxic because it prevents the oxygen from binding to the hemoglobin.

In the normal course of smoking there's certainly no indication that carbon monoxide is -- is toxic to a smoker. Smokers aren't cyanotic; smokers

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obviously get enough oxygen. I think that this is a matter of degree. In your garage it can be -- can be toxic under those conditions. However, we're continually exposed to various levels of a variety of different things, and it's a relative issue.

Q. Is it a health issue on any level as far as you're concerned?

A. It can be, given -- given certain circumstances, levels, continuous exposure, potentially, and depending on the individual.

Q. And as of 1969, putting aside the question of the relative weight to be ascribed to carbon monoxide as a health effect, was there any doubt but that carbon monoxide had a health effect in humans?

MR. NUNLEY: You mean -- objection. You mean as it was found in cigarette smoke --

MR. SILBERFELD: Uh-huh.

MR. NUNLEY: -- or --

MR. SILBERFELD: Yes.

A. I think I just indicated that this statement indicates that the single most toxic compound in gas phase is carbon monoxide. I'm not sure I would necessarily agree with -- with that particular statement in 1969. There -- there was some information, but I -- you know, it's not necessarily

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a --

Again, this is not a reference document with data attached that proves the data that goes to that statement. I think the issue here fundamentally is is carbon monoxide is something that we can -- we know binds to hemoglobin. Okay? It can happen. But it happens every day, it's happening right now, and I think that it is a matter of degree. Water, too, can be toxic to people, you know, if -- in the degree that you're exposed to it in a certain way. And indeed, when you're talking about toxic substances, fundamentally you have to look at the conditions under the exposure and the degree and the level of the material. That it was --

Again, as the other documents, I take this as another indication that various components of smoke were looked at, and there were certainly discussions relative to these components and further study, and we did follow up on further study in terms of reducing carbon monoxide specifically.

Q. The next sentence to the one that we've been focusing on --

A. Uh-huh.

Q. -- reads, "Blood levels of CO, determined as carboxyhemoglobin, are elevated in smokers." Do you

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see that?
A. Yes.
Q. That would represent, would it not, an abnormality --
A. Um --
Q. -- or an out-of-norm finding?
MR. NUNLEY: Objection, compound.
A. I would have to review the data at the time. I think also, specifically in 1969, the tar levels were and the deliveries were higher. I think now with the ventilation, the deliveries are -- are relatively lower. Whether or not --
If indeed that was true, and I would have to review the data, I would wonder if it is true today. I don't know.
Q. We're back in 1969 --
A. Uh-huh.
Q. -- and I want you to accept it as true. You have no reason to doubt the accuracy of this; do you?
MR. NUNLEY: Objection, foundation.
A. I have no reason to -- I -- I --
I'm an individual that needs data to -- in order to verify on confirm. A scientist doesn't accept a statement without a reference or the data to support it. Anybody can make a statement or a judgment, but

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you need to receive the data and evaluate it. There has to be support to the statement in order to take it for -- for its value.

Q. Accept it as true for purposes of my question.

A. All right.

Q. If it's true that blood levels of carbon monoxide are elevated in smokers, as stated here, that would be an abnormality; would it not?

A. I think we're --

Again, abnormality? Not necessarily.

Q. Why not?

A. Well is increasing your heart rate an abnormality when you exercise? I think there are changes that people can go through that are normal, within normal physiological ranges. It's when it goes outside the normal physiological range that you become a toxic situation. If your heart goes way too high, for example, it becomes a health issue, but certainly if your heart rate is within the levels that are normal for exercise, it's not.

Likewise here, there are certain ranges of elevated carbon monoxide levels that I think would be considered within normal physiological exposure range in a -- in a certain occupational environment or even in city life, for example.

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Q. Are elevated levels of carbon monoxide beneficial to humans?
A. I wouldn't say that they were beneficial, no.
Q. They're just --
They just may not be detrimental.
A. That's correct.
Q. Let me show you Exhibit 171. You're familiar with this document; are you not?
A. Yes, I am.
Q. This is a report or a memo from Dr. Fagan to Dr. Wakeham concerning Dr. Auerbach's work?
A. Yes.
Q. In reviewing this document to prepare yourself for today, did you do any investigation of any kind surrounding the work of Dr. Auerbach?
A. Not specifically, no. But I had read other reports of his work prior to reading this document in preparation for today.
Q. Are you satisfied --
Is Philip Morris satisfied that as of 1970, Dr. Auerbach had produced emphysema in the dogs in his study?
MR. NUNLEY: Objection, vague.
A. Dr. Fagan certainly states that -- that that might be the case here. However, if you review the

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conduct of the study, and that is the nature in which the smoke was -- was provided to the animal through a tracheotomy tube, which would provide the opportunity for infection and irritation, and if you look at the comparison of the control and the test groups, I think that emphysema was produced in -- in -- in the animals as a result of the conditions of exposure.

Q. So no doubt in your mind that the dogs got emphysema or showed emphysema, but why they showed it or why they got it --

A. I think --

Q. -- is a matter of controversy to you?

A. Yeah. I'm not sure what they showed. I think it was certainly evident that the lungs of these animals -- these dogs were not necessarily normal, and I would be surprised if they would be if, under long-term tracheotomy conditions, you're not going to get some kind of infection. Also, the issue of pathogens in the -- in the environment of the air that was provided to the animals was also an issue.

Q. Do you believe that the means of exposure and the possibility of infection contributed to the development of carcinoma in these dogs?

MR. NUNLEY: Objection, foundation.

A. Yeah, I'm not -- I'm not sure that this is an

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experiment that I would make any conclusion about, quite frankly.

Q. Can't reach any conclusion from it.

A. I think that it is an issue whereby you cannot -- you did not have good control and a -- and a clean exposure, and I don't think you can make a conclusion on it.

Q. Let me show you what's been previously marked as Exhibit 1550. You've seen this before; have you not?

A. I believe so, yes. Although this one doesn't -- Yes, I have.

Q. This is a report of a smoke inhalation study done at the University of Southern California?

A. Yup. Yes, it is.

Q. On the respiratory tract of pathogen-free male and female mice?

A. Yes.

Q. And it reached the conclusion --

And this was work done under the auspices of The Council for Tobacco Research; right?

A. It is a CTR report, yes.

Q. Direct your attention to the third page in. With respect to the animals that were sacrificed after two and a half months of heavy smoke exposure, abnormalities were found; were they not?

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A. What they found was hyperplasia, which is basically a thickening of the epithelium. They also found cellular thickening, which is very clearly a sign of irritation. That's what was found.

Q. Hyperplasia is an abnormality; is it not?

A. Well hyperplasia may not be. I mean if you consider normal responses to irritants an abnormality --

I think that there are normal physiological mechanisms, protective mechanisms. I think that's a normal adjustment to those conditions per se. It does not reflect a specific and non-reversible change to those cells, if that's what you're asking.

Q. Would you regard a disruption of lung architecture as an abnormality, as described in the next section of that page?

A. Let's see. Well what -- what this is stating is is that in the area of microphage collection, the lung architecture was disrupted, and what that means is that the macrophages, which are a certain kind of cell -- it's almost like a PACMAN-type cell that eats foreign -- foreign material -- those macrophages were potentially secreting enzymes that were breaking down the -- the cellular structure. So in fact it was the macrophage, not the smoke, that was affecting the

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lung architecture, and that can happen in -- in viruses and colds and other conditions also.

Q. And it can happen from smoke.

A. It can happen, potentially.

Q. And it was found that the macrophage formation brought about lung changes characteristic of emphysema.

MR. NUNLEY: Can you direct us to where you're at?

THE WITNESS: Yeah. Where is that?

MR. SILBERFELD: Same -- same paragraph, second line from the bottom.

A. Well it said -- it said "may be...to bring about...should they remain there long enough," which means that's a hypothesis and not a finding.

Q. Okay. Did Philip Morris understand as of 1973 that, in laboratory animals, smoke was a sufficient irritant to cause microphage formation?

MR. NUNLEY: Objection as to form.

A. Well macrophages are cells in the body and they basically go to an area where there's an infiltration of a foreign matter, so they're normally -- normally present and produced under conditions of foreign substances. I think it would depend on the conditions, quite frankly. It's not necessarily

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something that would occur under normal circumstances. It would depend on the material, the length of exposure, the dose, et cetera, as to whether or not you would see that particular effect.

Q. Let me show you what I believe has been previously marked as 1329. And that's the only other copy I have of it. This is a document of Philip Morris; is it not?

A. It is a document from the Philip Morris Europe Research Laboratory.

Q. Okay. And it's entitled "THE CURRENT SITUATION OF SMOKING AND HEALTH, April 1974?"

A. Yes.

Q. Direct your attention to page 11, and the numbers are at the upper right.

MR. NUNLEY: You say you think this was previously marked?

MR. SILBERFELD: Yeah. I have a number on mine of 1329. I guess we could check that.

(Reporter shakes his head.)

MR. SILBERFELD: I guess we can't.

Q. Directing your attention to the second-to-the-last paragraph, it says, "It is well established that cigarette smoking is the primary factor in the pathogenesis of disabling chronic

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bronchitis." Do you see that?

A. I see that sentence, yes.

Q. Did Philip Morris accept that as true as of April 1974?

A. I think that this document again represents a review of the available literature in a number of different areas. I think that there are statements here that reflect some of the conclusions of people outside of Philip Morris and not necessarily the conclusions of people inside Philip Morris, and in some cases it may reflect specific reports that are referenced in the back. May not necessarily be Philip Morris's opinion.

Q. Well as the spokesperson for Philip Morris here today, --

Q. Yes.

A. -- did Philip Morris as of this time accept as true that cigarette smoking is the primary factor in the pathogenesis of disabling chronic bronchitis as of this time?

A. Let me read the --

Q. Sure.

A. Around the --

Again, if you go to the next page, it continues on to a specific study that was done in -- in 22

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months regarding filters. I think that this best represents a discussion of the literature and not Philip Morris's opinion in 1974.

Q. Well what was Philip Morris's opinion as of April 1974 as to whether or not cigarette smoking played a role in disabling chronic bronchitis?

MR. NUNLEY: Objection, vague, the use of the term "played a role."

A. I think that the opinion per se was that this was an area, an identified area to look at, to follow up, to review, to do study on, as this is another document that I would characterize as a planning document, a review of the literature of some of the issues and idenfitying some areas for further work. So I don't think it is a conclusion, I think it is an identification of further work that would be required to be done in this given area, and there's some data presented here.

Q. As of 1974 did Philip Morris accept as true that cigarette smoking is a factor in atherosclerosis?

MR. NUNLEY: Objection, vague.

A. Is there a reference to that specifically?

Q. Sure, at page 15 at the bottom.

A. Okay.

Well what this says is that "...cigarette

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smoking is not a separate factor in the pathogenesis of atherosclerosis but acts by increasing the second of the two major factors, hypertension and a raised serum cholesterol." I think that, obviously, this is an area that there's still a lot of discussion. You can -- you can look at -- you can look at the public health reports on cholesterol and -- and one day you'll see it's good to eat eggs and the next day you'll see it's not and back again. I think that there are a number of factors that are involved in atherosclerosis and cardiovascular disease. I think that all of them warrant study. However, the relative degree of involvement I think may be dependent on the individual, their circumstances, and it isn't clear right now which one, if any, have an overall predominant influence on the genesis of any kind of cardiovascular disease.

MR. SILBERFELD: Let me have marked as next in order a multi-page document on the letterhead of Philip Morris U.S.A. Research Center, it bears Bates number 1000028264 to 28284

(Plaintiffs' Exhibit 4860 was marked for identification.)

BY MR. SILBERFELD:

Q. You've seen this before; have you not?

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A. Yes, I have.
Q. What is it?
A. It's an internal Philip Morris R&D report dated September 28th, 1978, on "NITROSAMINES IN FOOD, ALCOHOLIC BEVERAGES, AND TOBACCO - OCCURRENCE AND TOXICOLOGY," written by Judith E. John.
Q. And do you know who Judith E. John was as of this time in 1978?
A. Yes, I do.
Q. And who was she?
A. She worked in a group that was one of the groups I was referring to earlier that did keep track of the literature, review the literature periodically on certain topics, and she was a person that had expertise in doing literature searches.
Q. By 1978 did Philip Morris have an understanding as to which specific nitrosamines were contained within tobacco smoke?
A. I think there was by 1978 certainly more information about that. By 1978 both NNN and NNK had been identified in smoke, but it was about 1978 when the thermal energy analyzer was acquired and was put to use in terms of beginning to analyze specifically the tobacco-specific nitrosamines in smoke, because the methodology was just available -- made available.

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Q. Is it Dr. John or Ms. John?
A. No. As a matter of fact, none of these individuals on this report are scientists. Judy John at the time, again, was more of a librarian, a database searcher. And Murray Rosenberg and Harry Daniel were in charge of the library and the administration. None of these individuals are scientists. And I think this is a report of the literature for the scientists to review.
Q. And it's directed to the people on the distribution list?
A. That's correct.
Q. Okay. At page four, with the numbers at the bottom again, under the section "NITROSAMINE CARCINOGENESIS IN MAN," do you see that section there?
A. Yes.
Q. Ms. John writes, "Although there is very strong evidence for the carcinogenic potential of nitrosamines, there are no conclusive epidemiological findings of nitrosamine-induced cancer in man. However, the range of animal species susceptible to nitrosamine carcinogenesis and the fact that no animal tested has proven to be resistant to nitrosamine carcinogenesis leads to the likely

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conclusion that man is not resistant to these potent carcinogens."

A. Uh-huh.

Q. Do you see that?

A. Yes.

Q. Was that the prevailing view on the potential carcinogenic effect of nitrosamines in man at Philip Morris in 1978?

A. I think that is a fairly good representation of the knowledge at the time, that depending on man --

There's no reason to believe that man was resistant at the time -- resistant at the time to nitrosamines. However, the animal studies obviously involved very, very high doses, so it's a matter of relative exposure as to whether or not you're going to see an effect in -- in man per se. And to date, nitrosamines have -- have not yet, to my knowledge, been established to be human carcinogens by any kind of regulatory agency.

Q. As of 1978, how many different animal species had been exposed to nitrosamines?

MR. NUNLEY: Objection, foundation.

A. Ooh, I don't think I've specifically done a 1978 review of the studies that were available at the time. I know --

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Q. What's your best recollection?
A. I'm sure mice have been exposed, rats have been exposed. I know hamsters now have been exposed. At the time I couldn't -- I couldn't really estimate what species had been.
Q. And is it true that none had been resistant to tumor development as a result of nitrosamine exposure?
A. Well I think that given certain conditions or the design of the experiment, you could induce tumors, but I also know that the results were -- were varied depending on the conditions of the experiment. You might get tumors in different organs, you might see different tumors in different animals with different nitrosamines, so there isn't a lot of consistency in those results.
Q. Did Philip Morris believe as of 1982 that there was serious doubt or serious questions about a suspected link between smoking and cancer?
MR. NUNLEY: Objection, vague.
Q. Was that the company's view as of that time?
A. Will you repeat that, please.
Q. Let me just restate it.
A. Okay. Thank you.
Q. As of 1982, --

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A. Uh-huh?
Q. -- did Philip Morris believe that serious questions existed about a suspected link between smoking and cancer?
MR. NUNLEY: Objection, vague.
A. 1982?
Q. '82.
A. '82.
Q. Fifteen years ago from today.
A. I would --
In 1982, I think that, obviously, the state of the -- of knowledge is the same as -- as it is reflected today, and that is when you're talking about the word "link," it -- it's subject to interpretation. If you're saying is there an association, if that's your definition of "link," I think that the studies indicate an association. If you're saying if there is a causal link, then I don't think that that has been scientifically proven.
Q. But as of 1982, to the extent that there was a statistical association between smoking and lung cancer, Philip Morris believed that to be the case?
MR. NUNLEY: Objection as to form.
A. I recall statements that there was an association very early on, and one can take the word

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"association" and imply that that certainly means statistical association. So I'm --

You know, those statements had been made prior to that time.

Q. Let me show you what's been marked as Exhibit 678. You've seen this before; have you not?

A. Yes, I have.

Q. What is it?

A. It is a series of statements on a variety of -- wide variety of issues, and it's entitled "Tobacco Issue and Answers."

Q. What was the purpose of the preparation or creation of this document?

MR. NUNLEY: Objection, foundation.

A. I was not involved in that and I really don't know.

Q. When you prepared yourself for today and read this document, did you wonder how this one came to be?

A. Not specifically, no.

Q. Did you talk to anybody about the background or history of the creation of this document?

A. No.

Q. Was this a public document, or was this for employees of Philip Morris, or what was it?

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A. My understanding is that this was a series of advertisements that did appear in newspapers over a period of time.

Q. Every one of these pages?

A. I really can't attest to that. My understanding is that they were a series of ads that went in to newspapers, but that's my knowledge.

Q. From my look at it, and this obviously is just my view, it appears to be a booklet of -- of some type because of the sort of tabular titles at the right-hand margin. Do you see those?

A. Uh-huh, yes.

Q. Is that a fair characterization of it, do you think, or not?

A. Yeah, I think potentially that that's a fair characterization.

Q. What department within the company prepared this?

A. I really am not familiar with the specifics of that.

Q. Do you know when this document was created?

A. My recollection, I --

Specifically, no. But certainly in the last -- I believe in the last 10 years it's been created.

Q. If you could turn to the third page in, the page

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entitled "Health."

A. Uh-huh.

Q. It says in the first paragraph, "Philip Morris acknowledges that smoking is a risk factor for certain human diseases, but we believe consumers already are aware of these potential risks. There have been warning labels on every cigarette pack since 1966."

A. Yes.

Q. To the extent that this represented a public acknowledgment by Philip Morris that smoking is a risk factor for certain diseases, when was it that the company for the first time ever made that public knowledge? Was this it, or was it at some other time?

A. Well not knowing the specific date of this, that would be difficult. I think, again, the issue here is -- is that knowledge changes over time, and it is very difficult to say, you know, specifically when this event or change occurred. I think that one needs to look at the preponderance of evidence, one needs to look at the fact that these warning labels which stated a far greater conclusion than this were on the packs since 1966. It then is kind of a moot point to basically need to consider or worry about

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any kind of change in -- in that basic conclusion about a risk factor; a far more significant warning was on the pack since 1966.

Q. Those packs said that the Surgeon General had determined that smoking was a cause of certain health effects; right?

A. Yes.

Q. Not that Philip Morris had made that conclusion.

A. It states that the Surgeon General has concluded.

Q. Okay. My question is: When was it for the first time that Philip Morris publicly acknowledged that smoking is a risk factor for the development of certain human diseases?

A. Again, I think that if -- if a consumer is looking at a pack of cigarettes and sees that printed on the pack, I think it is, to a consumer, significant that this is printed on the pack that the Surgeon General is -- is saying this. I really don't think it is an issue as to who is saying this. I don't think Philip Morris has ever contradicted per se that; that is, a potential exists. I think that there has been over the years an ongoing quest for an understanding and an evaluation at any given point in time of the data. It's not an all-or-none. And I

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think the fact that the warning labels were on the pack, as is pointed out here, that consumers were well aware of the potential issue.

Q. When was it that Philip Morris for the first time acknowledged a statistical association between smoking and some human diseases?

MR. NUNLEY: Objection, asked and answered.

Q. Publicly?

MR. NUNLEY: Excuse me. Asked and answered.

MR. SILBERFELD: Asked, not answered.

MR. NUNLEY: Well that would be your opinion. You haven't got the answer you'd like.

MR. SILBERFELD: No, I haven't gotten an answer.

MR. NUNLEY: No, I disagree, I don't think you've gotten the one you like.

MR. SILBERFELD: Okay.

MR. NUNLEY: And I think it's inappropriate to badger the witness. I think we've been going beyond the time we talked about finishing.

A. I think there obviously is this instance, and I think there was statements in the annual reports. I think, though, again, I will state that I think that's a moot point when the warning labels have been

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on the packs since 1966.

Q. Regardless of how consumers perceive it, regardless of the warning packs on the labels --

MR. SILBERFELD: And I haven't gone beyond my time because I'm 15 minutes inside of my time.

MR. NUNLEY: Well I mean we talked about starting at 9:00 and ending at 12:00.

MR. SILBERFELD: Right. We -- we started at 9:10 and we've taken multiple breaks and we're 2:45 in running time, so we haven't gone three hours.

MR. NUNLEY: Well, I mean, I don't want to debate it with you. We talked about starting at 9:00 and ending at 12:00, and I always assume we'll take some breaks. But if that wasn't the assumption, I misunderstood it.

BY MR. SILBERFELD:

Q. When was it, other than in this document, that Philip Morris publicly acknowledged a statistical association between smoking and disease?

A. There were statements by -- in presentations by individuals, there were, as I said, in 1990 in the annual report, there were statements about an association or risk factor. So the bottom line here is is that there were periodic evaluations of the

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status over time, and discussion. But when you have an issue that is so widely looked at and studied, when you have an issue that's had a Surgeon General's report devoted to it on a regular basis since 1964, when you have an issue where the statement is on the pack, it is -- it is, you know, fundamentally for me a moot point. The public health community is -- is making those communications, is providing those communications, and the information is well-reviewed, studied, and looked at by many people. And that's my -- my position on it.

Q. You mentioned the '90 annual report. Is that one of the reports where the acknowledgment is made?

A. Yes.

Q. Was that the first one you saw?

A. I think it's the first one that specifically came out with that wording. There were other discussions of smoking and health throughout the reports.

Q. But the first one that you recall that had that wording in it was in the '90 --

A. I believe so, yes.

Q. -- annual report?

A. Again, that's a report for the shareholders. The consumer reads the pack.

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MR. SILBERFELD: Okay. That's all I have.

MR. NUNLEY: Why don't we take about two minutes, and I have a couple questions.

THE REPORTER: Off the record, please.

(Recess taken.)

DIRECT EXAMINATION

BY MR. NUNLEY:

Q. Dr. Ellis, I'm Chip Nunley. I'd like to ask you a couple of questions on behalf of Philip Morris to follow up, really, on some of the issues that Mr. Silberfeld asked you about earlier today. And I'll start by asking you about some terminology that he pointed out in several documents, and I'm thinking, for example, of Plaintiffs' Exhibit 166. Do you have that?

A. Yes.

Q. On page two of that document he referenced -- or he pointed you to a reference of polynuclear hydrocarbons. Do you recall that?

A. Yes.

Q. And I think he asked you to read this sentence, or perhaps he read this sentence to you, "These substances are the first known carcinogens and are present in cigarette smoke to the extent of about one hundred millionth of a gram per cigarette."

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My question is: In determining whether or not something is a carcinogen, is the exposure that's made to the animal an exposure that's similar to what you would expect to be the exposure a normal human would encounter?

MR. SILBERFELD: Objection.

MR. NUNLEY: Basis?

MR. SILBERFELD: I don't have a statement. Shouldn't state one, as I understand the rules.

A. No. The exposure and the definition of a carcinogen is really defined by a specific experiment, and the experimental design is to expose an animal as long as possible, normally over its lifetime, to the highest dose possible and yet keep that animal alive. So frequently you're looking at biological effects that are not normally encountered in the environment. So these are abnormal situations in design. So it merely classifies the compound as a carcinogen under those conditions, not necessarily under other conditions.

Q. So as I understand it, what you just said is that you could take a mouse or a rat and expose them to a given substance right up to the level that would almost be toxic, that would almost kill them over some period of time, and if at the end of that period

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the mouse or the rat had survived that exposure and a tumor was developed, one might conclude on that study that it was carcinogenic?

MR. SILBERFELD: Objection.

A. That's correct.

Q. Okay. And I think --

Let me ask you, if you would, to turn, then, to another document that Mr. Silberfeld showed you. I think it's 1550. It's a Council for Tobacco Research document. Do you see that?

A. Yes.

Q. Okay. He asked you about some findings that were made of mice that were exposed to smoking. Do you recall that?

A. Yes.

Q. What he didn't direct you to were the conditions under which the mouse -- or the mice were exposed, and let me ask you to turn to the first page of the -- excuse me, first internal page of the document, and do you see the paragraph that is referenced "ACUTE HEAVY SMOKE EXPOSURE?"

A. Yes.

Q. Do you see the sentence that begins, "The mice were then approximately 4 months" old?

A. Yes.

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Q. Could you read that sentence and the two sentences that follow for the jury, please?
A. Sure.
"The mice were then approximately 4 months of age. Thirty-six mice were exposed to increasing concentrations of cigarette smoke over a 2 1/2 month period. During the final 20 days, they were exposed to three cigarettes simultaneously seven times a day. The details of the experiment are given in the progress report IV dated August 31st, 1972."
Q. Okay. Now to put that into some context of what that would mean to human exposure, if a human were exposed to the same smoke levels as these 36 mice were, I'd like to ask you some questions. What is --
I know you're a scientist and have some scientific training. I take it in your career you've had occasion to work with laboratory mice and rats?
A. Yes.
Q. What is a generally accepted body-weight number for a mice -- or a mouse? Excuse me.
A. Well actually, a mouse is much less than a rat. A rat is about a hundred to two hundred grams and a mouse is much less, so you're talking about just a few, maybe 10, 25 grams.
Q. Is that right?

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A. Yeah.
Q. So -- well let's -- let's --
You say a rat can be, for example, 200 grams?
A. Well when you start out with a young rat, it's about a hundred grams. And as a matter of fact, we design our studies to specifically start with that size, that size rat. And then over the course of the study, obviously, the rat grows, and you can end up with a rat being in the three-, four-hundred-gram range.
Q. Okay. This study was done over -- it looks like they started when they were four months old and -- and they did the study for about two and a half months, so when they -- when they finished exposing these mice to this cigarette smoke, they would have been roughly, I guess, six and a half months old.
Is it fair to say that -- again assuming a rat -- that after that six and a half months, the rat might weigh 200 grams?
A. Sure. Yeah. I mean you -- you'd be an order of magnitude probably less even for a mouse. For a rat you'd -- you'd -- a good average weight would be about 200.
Q. Okay. In humans, is there a generally accepted weight for a -- sort of a normal human being

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expressed in grams or kilograms?

A. Frequently in the scientific literature the scientists will use a 75-kilogram man, which is approximately around 160, 170 pounds.

Q. Okay. And frankly for my benefit, --

A. Yes.

Q. -- maybe it's for the benefit of some of the members of the jury, a kilogram -- one kilogram is equal to one thousand grams?

A. Right.

Q. Okay. So if you had a mouse that weighed 200 grams --

A. Uh-huh.

Q. -- and you wanted to compare that to a human that weighed 75 kilograms --

A. Well you'd have a rat that weighed 200 grams.

Q. I'm sorry.

A. Yeah.

Q. Two hundred grams.

A. Yeah.

Q. What you'd do is -- is basically convert the 75 kilograms to grams.

A. That's correct.

Q. And that would be 75,000 grams?

A. Seventy-five thousand.

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Q. Okay. All right. Now these mice in this study says were exposed over the last final -- or over the final 20 days, they were exposed to three cigarettes simultaneously seven times a day. Do you see that?
A. Yes.
Q. Okay. To compare what the human-exposure equivalent of that would be, if a mouse -- excuse me -- if a rat weighed approximately 200 grams and a human weighed approximately 75,000 grams, would you agree with me that you'd be looking at a factor difference of almost 400 between the rat and the human?
A. That's correct.
MR. SILBERFELD: Objection. Move to strike the answer for purposes of interposing an objection.
Sorry. I didn't get in there in time.
MR. NUNLEY: Okay.
BY MR. NUNLEY:
Q. Well assuming that differential, that 400-time differential, if the rat -- excuse me. If the --
If a rat was given three cigarettes at a time, then to make a comparable human exposure, given that the human is about 400 times larger than the rat, you would give the human 1200 cigarettes?
MR. SILBERFELD: Objection.

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A. That's correct, if it was a rat. If -- that's -- that's correct. There's a 400 difference, and 400 times three is 1200 cigarettes, so to -- to do that experiment in the human and have the -- approximately the same exposures, you would -- you would have to have 1200 cigarettes simultaneously seven times a day.

Q. Okay. And what you told me when we started this, that if you're thinking of a mice instead of a rat -- a mouse instead of a rat, that you're really down in the neighborhood maybe of 50 grams?

A. Yeah. Even less than that, yeah.

Q. So you might even have to increase that 1200 cigarettes by a factor of four?

A. I'd say --

MR. SILBERFELD: Objection.

A. -- more like a factor of 10, so you're -- you're way up there.

Q. Okay. And by "way up there," --

A. Another --

Q. -- I mean we're talking in the --

A. -- Hundred and twenty -- well, 1200 to 12,000.

Q. Okay. And that's, as you said, for the purpose of maximum acute heavy smoke exposure in this study; is that correct?

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A. Yes.
Q. Okay.
A. Yes, that's what it states.
Q. Okay. Now the documents that -- couple of documents that Mr. Silberfeld show you, and I'm back to the -- the technical forecast that Dr. Wakeham sent to Mr. Cullman in 1963. Do you see that?
A. Yes.
Q. Mr. Silberfeld asked you, turning now to the third page of that document, he was asking you some questions about the cardo -- cardiovascular effects of smoke.
A. Uh-huh.
Q. I think he read to you a sentence that said, "If forced to, we could produce a fairly tasty low nicotine product." Do you see that?
A. Uh-huh, yes.
Q. Now to help put this in context, in 1963 what would a fair average have been for all the cigarettes that were being sold in terms of the tar and nicotine deliveries?
MR. SILBERFELD: Objection.
A. Well if we start out before filters began to be used in the -- in the '50s, we -- we look at a tar delivery of about 35 -- 35 milligrams. So by 1963 I

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would estimate the average deliveries to be in the 25- to 30-milligram range.

Q. And the --

A couple of the compounds that Mr. Silberfeld asked you about, for example, polynuclear hydrocarbons and the tobacco-specific nitrosamines, are those generally found in the tar constituent -- to the extent they're found at all, are they generally found in the tar constituent of cigarette smoke?

A. Yes.

Q. Okay. And this 1963 document, in speaking of polynuclear hydrocarbons, says that they are present in cigarette smoke to the extent of about one hundred millionth of a gram per cigarette.

I'm sorry, that's on page two.

A. Yes.

Q. Do you see that?

And that would have been in reference to cigarettes that delivered 25 to 30 grams of tar -- milligrams of tar.

A. Right.

Q. Okay. Subsequent to 1963, did Philip Morris undertake research that resulted in design changes that could further reduce the deliveries of tar and

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nicotine?

MR. SILBERFELD: Objection.

A. Yes, absolutely.

Q. Okay. Can you tell the jury what some of those design changes are that results in -- resulted -- have resulted in -- well let me strike that.

Can you tell the jury what some of the design changes that Philip Morris has implemented that have resulted in a reduction of tar and nicotine?

MR. SILBERFELD: Objection.

A. Well surely. In the marketplace today we have cigarettes that deliver as -- as little as one milligram of -- of tar, and that's achieved by a variety of mechanisms. Obviously, filtration is a key factor, but also we've -- we've put in dilution or ventilation in the filter such that there are holes that air, when an individual puffs on the cigarette, they actually get air rather than smoke coming from the cigarette, so that dilutes the smoke and decreases the tar per puff.

There has also been tobacco-processing changes. We've expanded tobacco, so we've basically puffed the tobacco so that we can put less tobacco in the cigarette rod. That means that there's less material there to burn, and you create less tar.

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Those are some of the key changes. We also use porous paper to add ventilation and a variety of other design/construction changes, all designed to create the best-tasting cigarette with the lowest tar.

Q. Okay. In 1963 when Dr. Wakeham was writing to Dr. -- excuse me, to Mr. Cullman and referencing a fairly tasty low nicotine product, was there -- were there any one-milligram tar products on the market?

A. No.

Q. Does Philip Morris -- I should ask you this: What is --

We'll go to 1994. What was the sales-weighted tar and nicotine average of Philip Morris products in 1994?

MR. SILBERFELD: Objection.

A. I would say by 1994 we were probably in the 20-, 20-milligram range, and right now currently we're in the 12-milligram range.

Q. Okay. And Philip Morris has the Merit --

Are you familiar with the Merit ultralight product?

A. Yes.

Q. That's a one-milligram delivery?

A. Called Merit Ultima.

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Q. Merit Ultima, excuse me.
A. Right.
Q. Cambridge Lowest --
A. Right.
Q. -- is a one --
A. That's one milligram.
Q. Bristol Lowest.
A. Correct.
Q. And moving up the scale there's Merit Ultralights?
A. There's a Marlboro Ultralights that we're actually bringing out nationally, it's been in test markets. There are a number of cigarettes that have a variety of different tars all the way down the spectrum.
Q. And in terms of what we were talking about earlier, to the extent, for example, that a polynuclear hydrocarbon might be found in cigarette smoke in 1963 in the area of one hundred millionth of a gram per cigarette, and -- and assuming that that was a 25-gram cigarette that was being -- excuse me, 25-milligram cigarette that was being measured, comparing that to a Merit Ultralight, to make it easier to a Merit Ultima, which is one milligram, would that suggest that you would see, if any

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polynuclear hydrocarbons in that Merit Ultima, something on the order of one-25th of one hundredth of a milligram -- millionth of a milligram per cigarette?

MR. SILBERFELD: Objection.

A. You would --

You would certainly significantly reduce even further the level, and I think that's a reasonable assumption, yes.

Q. You became --

Well you went to work for Philip Morris's research and development department when?

A. 1980.

Q. Did Philip Morris then have under way efforts to reduce further tar and nicotine deliveries?

A. Oh, yes, absolutely.

Q. And during your tenure with the research and development department, have those efforts continued?

A. Absolutely.

Q. Do they continue through 1994?

A. Yes, they do. They continue today.

MR. NUNLEY: Those are all the questions I have. Thank you.

MR. SILBERFELD: I have a few questions, but I can do it right from here.

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RECROSS-EXAMINATION

BY MR. SILBERFELD:

Q. Dr. Ellis, what is tar, as you've used that term?

A. Well tar is TPM minus the water.

Q. What does that mean?

A. Well it's the particulate fraction of -- of cigarette smoke. And the way that's collected is on a Cambridge pad or a filter pad, and in that pad it also collects water, and so what we do is we analyze for the water content so that we get just the particulate portion of that, and that particulate portion is called the tar.

Q. As a scientist interested in precision, and I know you're devoted to it, --

A. Uh-huh.

Q. -- is tar a specific chemical?

A. No, tar is not a specific chemical.

Q. Tar is everything but the water; isn't it?

A. It is every -- every particulate-phase component but the water, and there are many, yes.

Q. How many?

A. Well purported to be well over 4,000.

Q. Some of those are carcinogenic?

A. In --

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By the definition that we just went through, in certain studies under certain doses in certain conditions, normally a lifetime and normally very high doses and not normal exposure, yes.

Q. And when tar as a whole goes down, does that mean each constituent, each of the 4,000, goes down by the same increment?

A. Basically that can happen, yes. It -- depending on the mechanism by which you're reducing the tar. For example, if you're putting a filter on, you may reduce one component more than another. In the tar, no, because filters do not selectively remove components from tar. But you can potentially affect the genesis of certain materials depending on the design/construction of the cigarette.

Q. But if we had a substance in cigarettes that was in there at a value of one, let's say, --

A. Uh-huh?

Q. -- and we cut total tar in half, --

A. Right.

Q. -- can you say scientifically that in the resulting cigarette, the substance we're -- that we had a value of one in in is now a value of a half?

A. You can say that that's a good assumption, which is what I said, yes. It would depend on how you

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achieve that, and you would have to do specific measurements. But there's no question that there is less of a variety of substances, a -- less of those 4,000 compounds in a one-milligram cigarette than there is in a 25-milligram cigarette.

Q. Tar is a collection of everything that's in cigarettes save the water; right?

MR. NUNLEY: Cigarette smoke.

A. In the gas phase.

Q. Cigarette smoke.

A. In the gas phase.

Q. And the only thing that's really reported by the FTC method that you're familiar with specifically is nicotine; isn't that right?

MR. NUNLEY: You mean --

A. Nicotine in tar?

Q. Well tar is an amalgam of things; isn't it?

A. Yes.

Q. It's 4,000 things.

A. Right.

Q. But the only thing that's reported individually, chemically specific, is nicotine.

A. Specifically in the advertisements, yes.

Q. Okay.

A. In some cases the CO is specifically designated,

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especially in Europe.
Q. And you mentioned that the company has over time developed lower tar and lower nicotine cigarettes; right?
A. Yes.
Q. And that's by this FTC machine method?
MR. NUNLEY: You mean as measured by the FTC.
MR. SILBERFELD: As measured by the FTC machine method.
A. Yes, that is the measure we're referring to when we talk about those numbers.
Q. Okay. And you're familiar, are you not, with the phenomenon of compensation?
A. I'm familiar with the studies reporting the experimental work that's done to evaluate that potential, yes.
Q. Do you accept as true that smokers compensate?
MR. NUNLEY: Well objection, vague.
A. Based on my review of the external literature and -- and the internal literature, I think there's some evidence that when a smoker first adjusts their -- to a different cigarette and they move to a lower tar cigarette, they may initially smoke the cigarette a little bit differently, but as they get

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used to the taste of that cigarette they -- they basically go to their normal smoking conditions.

The compensation studies are highly variable. The ones in the literature are sometimes done under experimental conditions and not normal conditions and use relatively few people. But overall, I think as a practical sense, we talked about reducing by FTC methods from 25 milligrams to one milligram tar delivery cigarettes, and I certainly don't see smokers smoking 25 times more cigarettes when they go down to that tar level. I think that there is a practical side to that issue and I just don't see a gross -- I mean observing smokers, I don't see a gross change in the way people smoke.

Q. Are you familiar with the literature that discusses the health effects of smoking low tar versus higher tar and nicotine cigarettes?

MR. NUNLEY: Objection, vague.

A. I've read reports that -- that have focused on that, yes.

Q. And did they report a difference in the health outcomes of people who smoke low tar or ultralow tar cigarettes with the regular full-flavor brands?

A. What specific outcome are you referring to?

Q. Any health outcome.

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MR. NUNLEY: Objection, vague.

A. Well there's -- there's all kinds of studies. There's -- there are studies, epidemiological studies that basically look at smoking cessation and/or smoking lower tar cigarettes, there are studies that look at differences in -- in people that smoke lower tar cigarettes, so it's a very broad, broad topic.

Q. Are you familiar with the literature that comes to the conclusion that there's no difference in disease potential in people that smoke ultralow tar cigarettes with those that smoke full-flavored brands?

MR. NUNLEY: Objection to the form. I think the term "disease potential" is vague.

A. I -- I think that the Surgeon General's reports would potentially disagree with that. I think that -- that there is an indication in those reports that -- that there was some -- some work that indicates that as -- as people basically quit smoking or as they went to lower tar cigarettes, there were -- there were different observations.

MR. SILBERFELD: That's all I have.

MR. NUNLEY: Okay. Thank you.

THE REPORTER: Off the record, please.

(Deposition concluded at 1:04 o'clock p.m.)

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C E R T I F I C A T E

I, Richard G. Stirewalt, hereby certify that I am qualified as a verbatim shorthand reporter; that I took in stenographic shorthand the testimony of CATHY ELLIS at the time and place aforesaid; and that the foregoing transcript consisting of pages 544 through 681 is a true and correct, full and complete transcription of said shorthand notes, to the best of my ability.

Dated at Washington, D.C., this 4th day of December, 1997.

RICHARD G. STIREWALT
Registered Professional Reporter
Notary Public

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C E R T I F I C A T E

I, CATHY ELLIS, the deponent, hereby certify that I have read the foregoing transcript consisting of pages 544 through 681, and that said transcript is a true and correct, full and complete transcription of my deposition except:

CATHY ELLIS
Deponent

Sworn and subscribed to before me this day of , 1997.

Notary Public

My commission expires .

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